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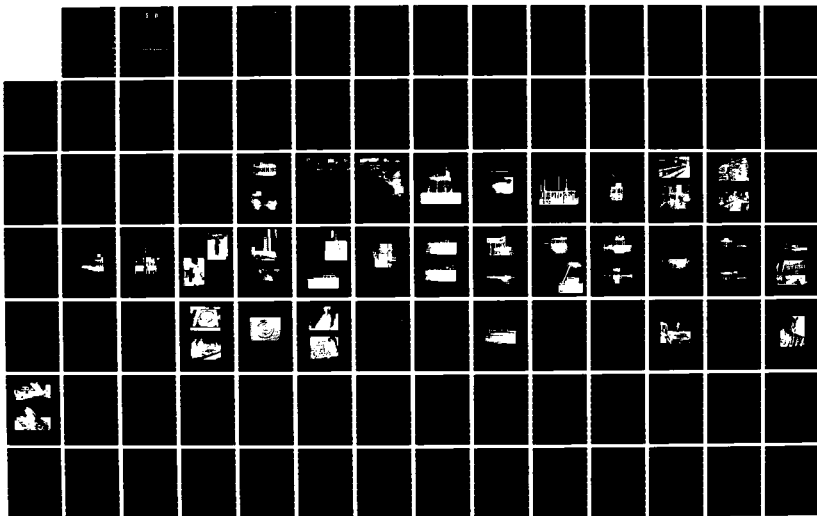
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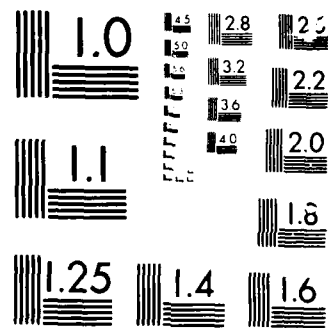
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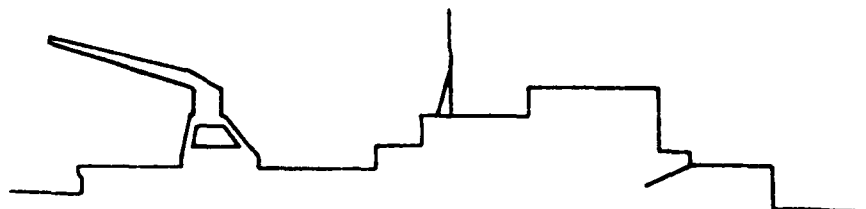
SALVAGE AND DEMOLITION
OF
TWO NAVY OFFSHORE PLATFORMS

By

WILLIAM N. SEELIG

FPO-1-84(32) OCTOBER, 1984

AD-A168 656



Ocean Engineering

CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
WASHINGTON NAVY YARD
WASHINGTON, DC 20374

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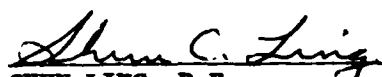
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APPROVED BY:


A. O. P. CASBARIAN, P.E.
Executive Vice President
Barnett & Casbarian, Inc.)


SHUN LING, P.E.
Director
Engineering Analyses Division

OCEAN ENGINEERING & CONSTRUCTION PROJECT OFFICE
CHESAPEAKE DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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Two large U.S. Navy offshore platforms at the Naval Coastal Systems Center, Panama City, Florida were salvaged and the supporting pile jackets demolished to form artificial fishing reefs. General characteristics of these 27 year old platforms demolished in the summer of 1984 are given in Table 1. (Con't)

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SALVAGE AND DEMOLITION OF TWO NAVY OFFSHORE PLATFORMS

STAGES I & II

NAVAL COASTAL SYSTEMS CENTER

PANAMA CITY, FLORIDA

by

William N. Seelig, P.E.

EXECUTIVE SUMMARY

Two large U.S. Navy offshore platforms (Figure 1) at the Naval Coastal Systems Center, Panama City, Florida were salvaged and the supporting pile jackets demolished to form artificial fishing reefs. General characteristics of these 27 year old platforms demolished in the summer of 1984 are given in Table 1. This was a joint project by the Chesapeake Division, Naval Facilities Engineering Command (Sanford Offshore Salvage, Morgan City, La. contractor), and the Explosive Ordinance Disposal Group Two, Detachment, Panama City, Florida (Table 2 gives project organization). Capt. C. C. King was the Commanding Officer of Naval Coastal Systems Center, Capt. L. K. Donovan was the Commanding Officer of the Chesapeake Division and Lt. J. DeSimone was the Officer-In-Charge of the EOD team.

SALVAGE AND DEMOLITION OF TWO NAVY OFFSHORE PLATFORMS

STAGES I & II

NAVAL COASTAL SYSTEMS CENTER

PANAMA CITY, FLORIDA

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William N. Seelig, P.E.

INTRODUCTION

The purpose of this report is to document the salvage and demolition in June-August 1984 of two offshore U.S. Navy platforms (Figure 1 and Table 1) for the Naval Coastal Systems Center (NCSC), Panama City, Florida. Platforms were located in the Gulf of Mexico as shown in Figure 2. This demolition project was conducted jointly by the Ocean Engineering and Construction Project Office, Chesapeake Division, Naval Facilities Engineering Command (CHESDIV), and Explosive Ordinance Disposal Group Two, Detachment, Panama City, Florida. Barnett & Casbarian, Inc. of Metairie, LA provided technical A/E support throughout the project. Work breakdown structure for the project is outlined in Table 2.

Stages I and II were two large offshore platforms built by Brown and Root, Inc. in 1957 to provide unique research facilities to the Naval Coastal Systems Center (formerly U.S. Navy Mine Defense Laboratory). After 27 years of service, NCSC found maintenance costs for the platforms were high and believed the platform structural integrity to be questionable. Therefore, the NCSC Public

Work Division tasked the Ocean Engineering and Construction Project Office (Code FPO-1 of CHESDIV) to evaluate the platforms. Underwater inspections, structural analyses, economic studies and an evaluation of alternative led to the recommendation to demolish the structures in 1981. CHESDIV was tasked in 1983 to proceed with designing the demolition. CHESDIV contracted Barnett & Casbarian to provide demolition plans and specification and support during demolition. The final demolition after coordination with NCSC, State of Florida, and various environmental was accomplished in the following manner:

- 1) A Chesapeake Division contractor cleaned and removed the platform decks. This approach minimized the possibility of pollution to Florida waters and adjacent beaches, which is a popular tourist area.
- 2) The Explosive Ordinance Disposal (EOD) detachment at Panama City demolished the platform jackets in place to form artificial fishing reefs. This approach a) provided EOD unique prototype explosive training, b) utilized excellent U.S. Navy diving support facilities available at NCSC, c) used cost effective Navy personnel and d) provided a valuable fishing reefs to the local sportfishing community.

This report gives a brief history of the platforms, summarizes use of the stages, documents the demolition work and presents lessons learned as a result of the project. A summary of the schedule and costs is also presented, which may be useful in planning future demolition work of a similar nature.

HISTORY

The Naval Coastal Systems Center (NCSC) first built a small four-pile platform (Figure 3) offshore of Panama City, Florida in the early 1950's. This platform proved to be a highly valuable facility at NCSC, but unfortunately a barge struck and destroyed the platform during hurricane Flossy in September 1956. This toppled structure was located soon after the storm and retrieved for salvage.

NCSC then decided to build two much larger offshore platforms, Stages I and II. Both platforms were of steel with aluminum siding for most enclosed spaces. Stage I measured 105' x 105', weighed 1,502 tons and was supported by sixteen piles. Stage II, the smaller platform, measured 84' x 60', weighed 697 tons and was supported by nine piles. The piles were tubular steel with trussed bracing above and below water level. The piles were positioned by steel jackets and driven into the sea bottom. Both platforms included a helicopter landing deck, various shops, equipment rooms, living quarters and mess facilities for the crew. The number, size and type equipment varied between the two platforms. Immediately prior to their demolition, Stage I carried 184 tons of equipment, while Stage II carried 101 tons of equipment.

Construction of the platforms by Brown and Root, Inc. began on 16 September 1957, but was delayed for a few days when tropical disturbance "Ester" struck the Florida panhandle area. Installation proceeded in the following sequence: the jackets ("legs") were placed on site, piles driven thru the legs to hold the jackets and finally the decks lifted on top and welded in place. Stage I had two eight-pile jackets that were later connected and Stage II had one nine-pile

jacket. The cost to originally build and install the platforms was \$3 million (1957 dollars). Figure 4 includes selected installation photos.

Both stages were originally designed to be manned full time and included facilities for 30 people on Stage I and facilities for a crew of 6 on Stage II. However, the crews living on board were removed in 1961 when it was decided that full time crews were too expensive.

USES

Numerous scientific and military research projects were conducted on the platforms. Some of the projects conducted during 1979 and 1980, for example, included:

- Evaluation of USCG oil containment booms.
- Ground truth for comparison to remote sensor measurements.
- Testing of various sea-going radars.
- Evaluation of effect of oil drilling contaminants on marine life.
- Signature measurements on various advanced craft.
- Evaluation of diver support equipment.
- Very specialized environmental measurements.

A further summary of platform use is given in Table 4 and a sample list of sensors on the stages is given in Table 5. Sample uses of the Stages are illustrated in photos given in Figures 5 thru 8.

REPAIRS AND INSPECTIONS

Numerous alterations were made to the stages over the years. After the manning crew departed in 1961, for example, the platforms were altered to operate automatically. Changes were also made to accommodate various experiments. For example, the aquarium room on Stage I was installed so that environmental studies could be performed on marine life.

Major storms occasionally damaged the stairways and catwalks, so they were periodically repaired. Another problem was to find safe ways to get personnel and equipment to and from the stages. Boat transport was used during mild wave conditions and helicopter support was provided for heavier equipment (Figure 5).

The first underwater inspection was performed by military divers 23-31 July 1968. Condition Reports in July 1968 and August 1969 followed this inspection. They found for the most part, extensive pitting in the jacket, several holes in the bracing and welds in good condition. These reports recommended several repairs and safety considerations. The inspections continued in mid-October 1969 on Stages I and II followed by inspection reports in November 1969. As a result of these reports, the cathodic protection systems of the Stages were overhauled in June and August 1970.

Several "swim-by" visual inspections by military divers were made during the 1970's. No written reports on results of those inspections were available.

The next formal inspection of both platforms was performed by CHESDIV under a contract for engineering analysis and field inspection awarded to Barnett & Casbarian, Inc. of Metairie, Louisiana. This underwater inspection, performed 3-9 December 1980, included visual inspection, cleaning of selected areas, meter readings, still photos and video documentation. This inspection found both Stage I and II to be in advanced stages of deterioration.

As a result of the inspection of 1980, analysis by Barnett & Casbarian, Inc., (BCI) showed that the platforms, as they existed then, did not meet minimum design standards for a five year storm wave. They found that for any kind of storm wave greater than those generated by a one year storm, overstressing of many of the members and joints occurred. As a result of these analyses, BCI suggested, CHESDIV endorsed, and NCSC adopted the following interim safety restrictions:

- a. Personnel were allowed on the platforms only during daylight hours and a stand-by boat or helicopter would be available at all times.
- b. No personnel were allowed on the platforms if seas were 7 to 8 feet or greater.
- c. Platforms would be visually inspected after each storm having waves of 10 feet or more - or at least once a year.

After the inspection in 1980 and the strength analysis in 1981 of Stages I and II, it was apparent that both platforms were in the advanced stages of deterioration. To rectify this situation, many different solutions were considered.

One of the solutions considered in the BCI 1981 Platform Strength Evaluation, involved restoring the platforms to working order. The restoration would include:

- a. Install insert piles
- b. Replace missing members
- c. Install saddles
- d. Grout key members
- e. Remove debris and add anodes
- f. Repair deck structures
- g. Additional engineering
- h. Contingencies

The cost of restoring the platforms, \$9,800,000 for Stage I and \$6,500,000 for Stage II, proved to be so prohibitive that it was not seriously considered.

Another alternative considered in the 1981 report was constructing one new platform. The Navy indicated, if a new platform were to be built, only one would be needed in 100 ft. of water. The estimated cost of the new platform was \$5,300,000 with equipment and quarters and \$3,300,000 without them. All costs in the BCI report were in 1981 dollars.

The last alternative suggested was to salvage both platform, which included removing decks, pilings and jackets. The estimated salvage cost was \$1,125,000. If the structure fell before salvage, the cost of salvage, which included recovering the debris from the bottom and cutting it up, rose to \$1,730,000 in 1981 dollars.

CHESDIV was tasked by NCSC in 1983 to proceed with designing the demolition. BCI was again contracted for this effort. In 1983, Barnett & Casbarian, Inc. issued their final report entitled "Demolition/Salvage Analysis of Offshore Platforms Stage I and II". In this report, they evaluated seven promising alternatives. Based on this evaluation and additional input it was decided to salvage the platform decks and demolish the jackets in place to form artificial reefs.

PERMITS

Many various interested agencies and groups were contacted in preparation of the final demolition planning. These included:

State of Florida, Department of Natural Resources

State of Florida, Department of Environmental Regulation

Florida Marine Patrol

U.S. Army Corps of Engineers

U.S. Environmental Protection Agency

U.S. Coast Guard

U.S. Minerals Management Service

Tenneco Oil Company

Bay County, Florida

Local Interested Parties

Preliminary Environmental Assessments for the project were completed 12 October 1983 and 18 April 1984. Permits to perform the work were obtained from the U.S. Army Corps of Engineers and the Florida Dept. of Environmental Regulation; a waiver for allowable water depths with unlighted buoys was obtained from the Coast Guard; and Bay County, Florida agreed to accept the fishing reefs once formed by the Navy. The Southern Divisions of NAVFAC prepared the necessary paperwork to return the land adjacent to the stages to Florida.

CHRONOLOGICAL HISTORY

A chronological history of the stages and work leading up to the demolition is summarized in Appendix A.

PLATFORM DECK CLEANUP, SALVAGE AND REMOVAL

The deck structures of Stages I and II underwent some cleaning, were removed and then salvaged. This procedure was adopted for the following reasons:

- (a) The decks had all materials (i.e. fuel tanks, lines and equipment) built in, so it would be uneconomical to cleanup all the materials on site.
- (b) Numerous potentially harmful materials were on board (petroleum products, asbestos, chemicals, red lead paint, etc.)
- (c) The deck had many rusted holes, so cleanup materials could likely spill.
- (d) The water depth at the sites was inadequate to place the whole decks as part of a reef.

- (e) Some of "the most beautiful beaches in the world" are nearby, so special care was required in performing the demolition work.

Therefore, it was decided to use a contractor to perform limited deck cleanup on site, remove and salvage the decks. CHESDIV, with the A/E services of Barnett & Casbarian, Inc., prepared the contract documents and competitively awarded the demolition contract to Sanford Offshore Salvage a small business located in Morgan City, La., on 1 June 1984. Organization of this work is illustrated in Table 6.

Sanford Offshore Salvage, Inc. removed the platform decks from both structures using the following procedures:

- (1) Asbestos materials were removed by the Jack Donahue Construction Company, Mandeville, La. (Bob Kieferle - onsite manager) under sub-contract to Sanford Offshore Salvage, Inc.
- (2) Diesel fuel was removed from tanks on the decks and the tanks filled with nitrogen gas to reduce the possibility of explosion or fire. The fuel was used by the contractor during the remaining work.
- (3) Miscellaneous equipment and other materials were removed.
- (4) The deck was cut into manageable sections leaving the legs and some key beams intact. (See Figure 9 for the cutting pattern used.)

- (5) Each section was rigged with a chain/wire rope bridle, final cuts were made into key members and the sections lifted off the structure.
- (6) Sections were transported and placed on a material barge spudded down in St. Andrews Bay.
- (7) Temporary navigation lights were placed on the remaining jackets at (+)14 foot elevation.

The sequence for removal was the same for both decks and a summary of equipment used by the contractor is given in Appendix B. A summary of the sections lifted is presented (Table 7 and Figure 9) and breakdowns of time given in Figure 10. Note that almost half of the days were "down time" because of the unusually large number of storms in the Florida Panhandle area (the contractor could not work in waves greater than four foot height).

Photographs illustrating various aspects of the deck cleanup and removal are given in Figures 11 thru 30.

DEMOLITION OF THE JACKETS TO FORM
UNDERWATER ARTIFICIAL REEFS

The stage jackets make excellent fishing reefs because the large exposed surface area (Figure 31 and 32) form a habitat and attract marine life. Artificial reefs are especially valuable to Florida waters because the sea bottom consists largely of a plain sand capable of supporting only modest amounts of sea life. It was impractical to leave the jackets intact due to the navigational hazards, so a decision was made to topple them in place to form underwater artificial reefs. Necessary permits were obtained to form these reefs and Bay County, Florida agreed to accept the reefs, once formed.

Captain King, the Commanding Officer, NCSC, tasked the Explosive Ordinance Disposal Group Two, Detachment, Panama City to perform this demolition for the following reasons:

- (1) It provided excellent prototype training.
- (2) Outstanding support is available from Naval Diving & Salvage Training Center at Panama City.
- (3) Use of Navy personnel gives optimum cost effectiveness.

CHESDIV provided an observer, Peter Williams, to monitor the demolition work.

TYPE OF EXPLOSIVE USED

A combination of military and commercial explosives were used to accomplish this demolition work. The combination of devices used was carefully selected to both efficiently accomplish the task and provide training with a variety of equipment.

Commercial Explosives

(Obtained from Jet Research, Mansfield, Texas 76063)

- (1) Binary liquid explosive of nitromethane and diethyenetriamine (NM/DETA). This binary explosive was selected because it is extremely safe, effective and easy to deploy. The NM/DETA was poured into shaped canisters holding 43 pounds of explosive (Figure 33). These charges were then lowered down inside to pile to a predetermined depth. These explosives proved to be especially effective because the force from detonation acted radially from inside the piles. Loss of marine life was also minimized by these charges, since much of the pressure wave from the explosive was dissipated by the time the explosive ruptured the piles.
- (2) NM/DETA was initiated by use of a "MACH Wave Generator" 100 grain/ft detonating cord.
- (3) Shaped circular charges in bracelet form (Figure 34) were used in two sizes (10-3/4", 18", and 12-3/4" to 18" sizes) and were selected as the optimum charge to cut piles and braces from the exterior.

Military Explosives

- (1) Composition C-4 (RDK). This is a plastic charge easily molded and was made up in 40 lbs. blocks as kicker charges and in 4 lbs. blocks used to sever cross braces. (Figure 35).
- (2) Flexible Linear Shaped Charges. (Figure 36). Used as a back-up severance charge on the cross braces. Results with these charges were not very successful. They did not sever as expected on the brace members.
- (3) Standard Detonating Fuse (Primacord). Designation in accordance with Mib-C-17124A. 1000 Grain's PETN/FL used as tails from main charges to trunkline/ring main.
- (4) Standard Detonating Fuse (Primacord) Designation in accordance with MIL-C-171248. 60 Grain's PETH/FL used as trunkline/ring main and all tails from charges were secured to this trunkline.
- (5) Standard blasting caps were used to initiate main charges, boosters, detonating cord (Primacord), and other initiators.
- (6) Firing Devices. M122 firing device which consisted of a transmitter (Figure 37) with a factory-preset frequency and 10 receivers (Figure 38) preset to the same frequency were used on the majority of shots. The receivers act as low-capacity, electric blasting machines.

- (7) On one sequence of firing it was noted that a length of safety fuse was used to initiate the main charge in conjunction with the M122 firing device.

DEMOLITION SEQUENCE STAGE I

The overall sequence for demolishing the platform jacket was dictated by jacket design, water depth and specified required depth over the artificial reef. The Stage I jacket consisted of two 8-pile jackets connected by cross braces above the surface (Figures 26, 39, & 40). The water depth at the site is 105 feet and a depth of no less than 55 feet is specified as being required over the highest point of the reef. The following demolition sequence was used on Stage I.

- (1) Severed connecting braces with a combination of small charges consisting of Jet Research circular shaped charges, flexible linear shaped charges, and C-4 plastic in 4 lbs. blocks. (Figures 34, 35, and 36).
- (2) The two jackets were then toppled with the explosive placement and sequence shown in Figures 39 and 40. Liquid explosive of Nitromethane and Diethylenetriamine (NM/DETA) was mixed into 43 lbs. shaped charge canisters. These charges were lowered down the inside of the jacket leg/piles to a predetermined depth. Kicker charges of 40 lbs. were lowered on the outside of the piles to ensure toppling in the determined direction (Figures 39 and 40). A spherical white buoy was attached with wire rope to the Northern section prior to firing and now marks the reefs' general location. Figure 41 illustrates a typical shot.

DEMOLITION SEQUENCE STAGE II

The sequence to topple the Stage II jacket is illustrated in Figures 42 and 43.

- (1) The braces connecting the nine jacket piles together below and above the water were cut with a combination of small charges, consisting of, Jet Research circular shaped charges, flexible linear shaped charges and C-4 plastic in 4 lbs. blocks. (Figures 34, 35, and 36).
- (2) The piles were then toppled in bents of three separate piles in a manner similar to the sequence used on Stage I. The only exception at Stage II was that a Navy vessel, LCM 8, secured a line to the three outer piles when the three east and west piles were toppled. The strain from the vessel, in addition to the careful placement of the kicker charges, ensured that the piles fell in the desired direction (Figures 42 and 43). Figure 44 illustrates one of the shots.

LESSONS LEARNED

- (1) Unless field conditions dictate otherwise, it is advisable to be down wind of a charge before firing. This will ensure that in the event of an engine failure, the fireboat will drift away from the charge.
- (2) The recommended method for severing pipes or beams, if shaped charges are not used, is to place the charge as to create a shear action at the time of detonation. The best results are obtained if one charge is placed on top of a pipe or beam and one on the bottom. The charges are staggered a distance equal to the pipes outside diameter, or the height of the beam, to be severed.

OBSERVATIONS

That this relatively hazardous mission was successfully completed without an accident speaks highly of the team's instructor and the excellence of leadership.

Relatively few fish were observed killed (Table 9) primarily because:

(1) The large charges were placed inside the piles to dissipate the pressure wave and (2) small "scare charges" were detonated just before larger charges were exploded. Fish that were killed did not go to waste (birds ate the smaller fish and the work crews collected the large fish, Figure 46).

PROJECT COMPLETION

The project was effectively completed on 30 August 1984 when the asbestos waste was disposed in an approved landfill site (Figure 47). Details on this material are given in Appendix E.

SUMMARY

Two large Navy offshore platforms, Stage I and II, owned by the Naval Coastal Systems Center, Panama City, Florida were salvaged/demolished during the summer of 1984. These obsolete platforms were destroyed because they were unsafe, provided navigation and pollution hazards and were expensive to maintain. Capt. C. C. King was the Commanding Officer of the Naval Coastal Systems Center. All work was coordinated with the Public Works Officer, Lt. E. C. Salling, and the

chief of the NCSC Engineering Branch, M. Southall. The Ocean Engineering and construction Project Office, Chesapeake Division, Naval Facilities Engineering Command, provided engineering support with the assistance of Barnett & Casbarian, Inc., Metairie, LA. Sanford Offshore Salvage, Inc., Morgan City, LA, under contract to CHESDIV, salvaged the platform decks and Bill Seelig of CHESDIV was the Engineer-In-Charge and onsite contract monitor. Explosive Ordinance Group Two, Detachment, Panama City, Florida demolished the jackets in place to form artificial fishing reefs. Lt. "Rocky" DeSimone was the Officer-In-Charge of the jacket demolition and Peter Williams was the CHESDIV observer to the jacket demolition work.

The salvage/demolition schedule for this project is given in Figure 45 and a summary of costs is presented in Table 10.

A bibliography of background information is attached as Appendix F.

ACKNOWLEDGMENTS

Thanks to the U.S. Coast Guard detachment at Panama City, Florida for securing the work area during critical phases of work.

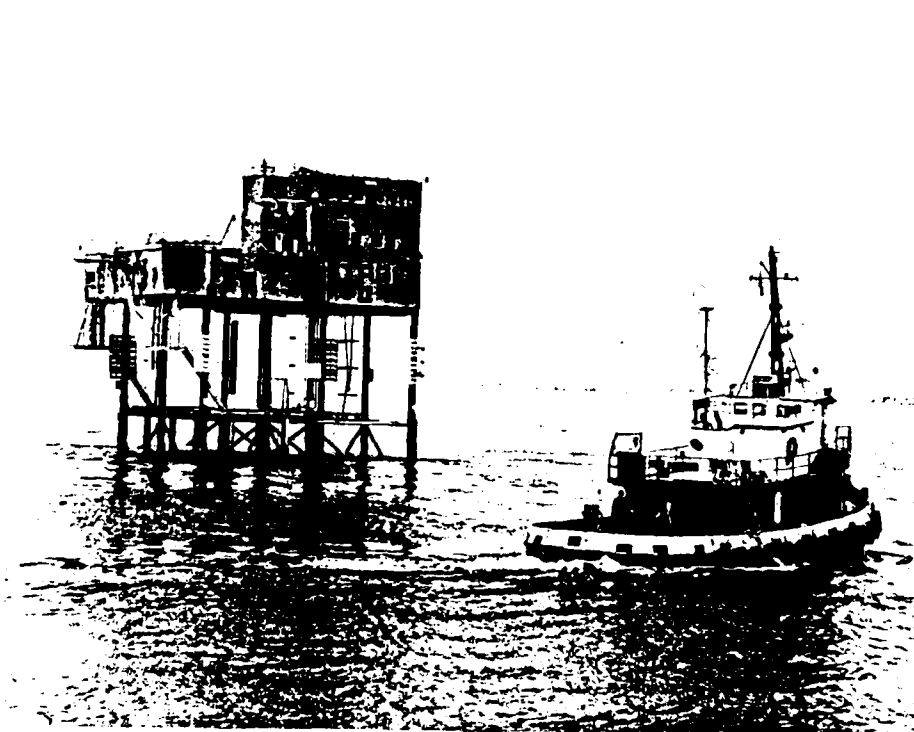
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| 3 | Photo of Platform at NCSC in the Early 1950's |
| 4 | Construction Photos of the Stages (1957) |
| 5 | Military Helicopter Lifting Scientific Equipment on Stage II |
| 6 | Photos of Environmental Experiments on Stage I |
| 7 | Installing a Wave Gage on Stage II |
| 8 | Monitoring Instrument Readings on Stage I |
| 9 | Plan Views of the Stages Illustrating the Cutting Pattern Used by the Contractor to Section Decks |
| 10 | Breakdown of the Contractor's Time on Site |
| 11 | Photo of the Contractor's Barge |
| 12 | Photo of Lifting The Sub-Contractor's Containers of Asbestos Removal Gear on Stage I |
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36 Flexible Linear Shaped Charges
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38 Demolition Signal Receivers
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42 Stage II - Plan Location of Charges
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44 Demolition Shot on Stage II
45 Salvage/Demolition Schedule
46 A Barracuda Picked Up After a Shot at Stage I
47 Disposal of Asbestos Waste

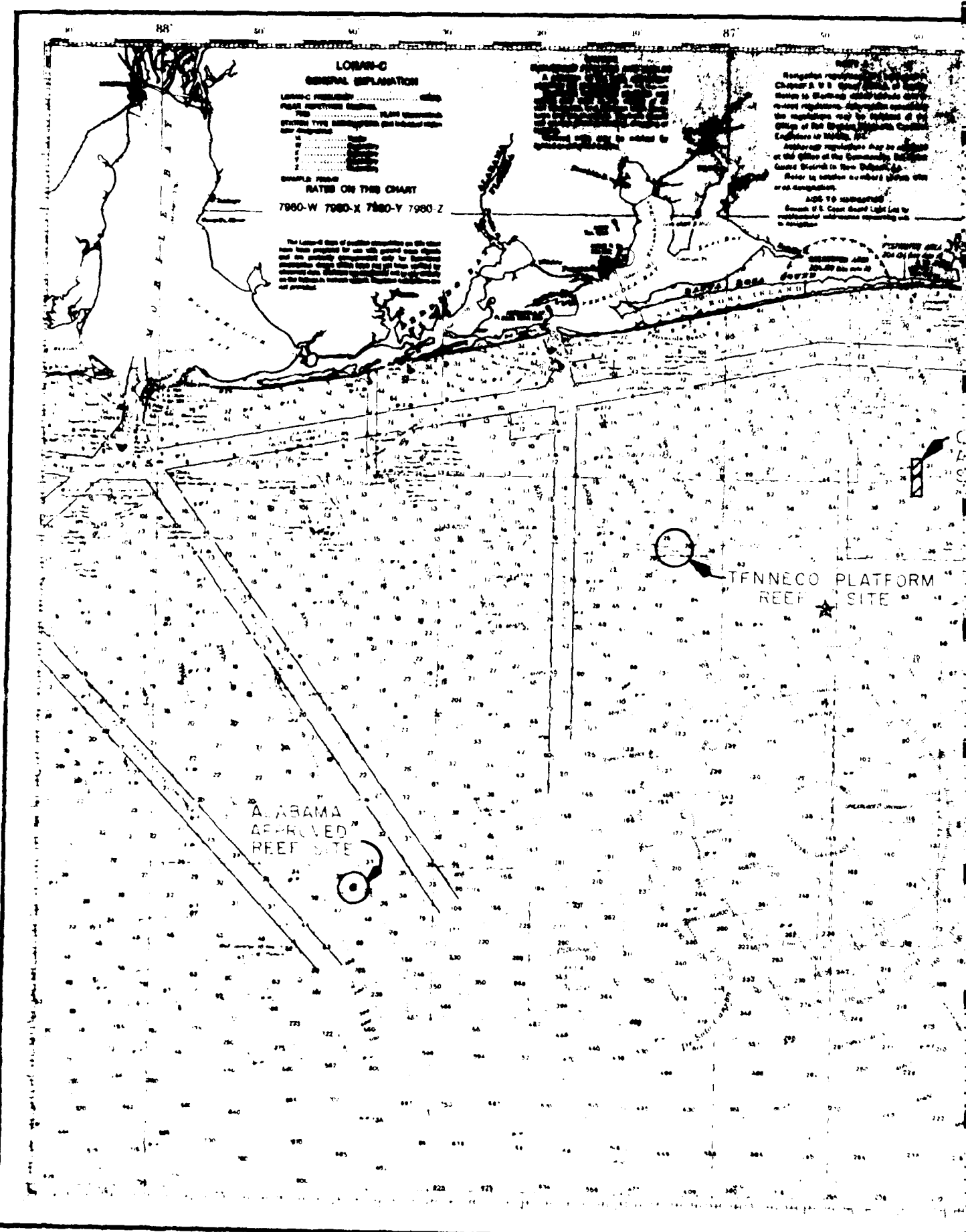


a) STAGE I (3 July 1984)



b) STAGE II (3 August 1984)

Figure 1. Offshore Platforms Salvaged/Demolished



LOBBING
GENERAL EXPLANATION

LOBBING PROHIBITED
PLEASE REPORT ANY DAMAGE TO THE
CHARTS TO THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
WASHINGTON, D.C. 20506

EXAMPLE: 7000
RATES ON THIS CHART
7000-W 7000-X 7000-Y 7000-Z

LOBBING PROHIBITED
PLEASE REPORT ANY DAMAGE TO THE
CHARTS TO THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
WASHINGTON, D.C. 20506

Navigation regulations may be found in
Chapter 5 of the U.S. Coast Guard's
Navigation Regulations, which are published in the
Office of the Commanding Officer, U.S. Coast Guard
Sector, 1000 1st Street, NE, Washington, D.C. 20002.
Refer to section number 1000.000 for
more information.

AGS 1000
AGS 1000 is a
U.S. Coast Guard Light List for
navigation information regarding
navigation.

ALABAMA
APPROVED
REEF SITE

TENNECO PLATFORM
REEF SITE

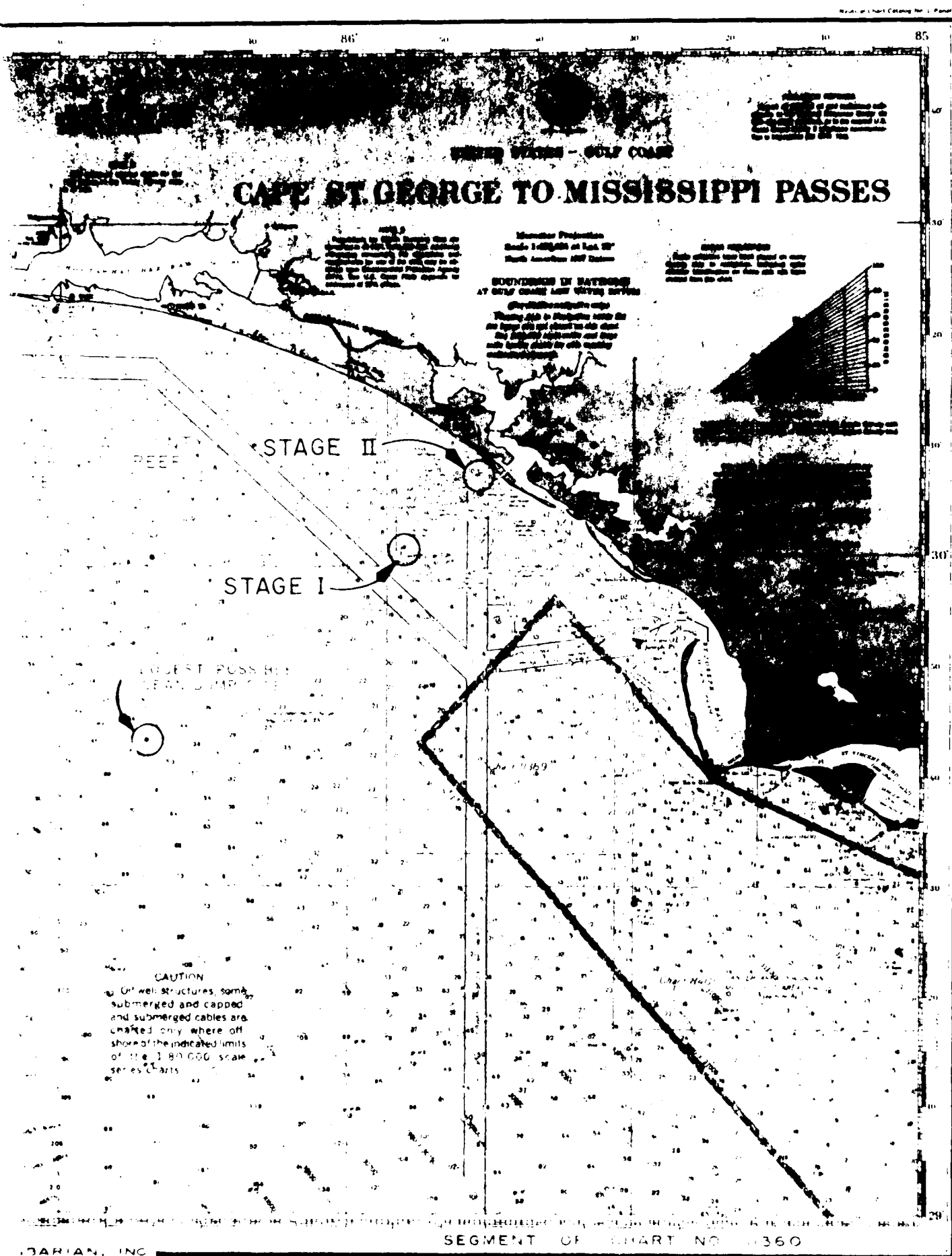


Figure 2

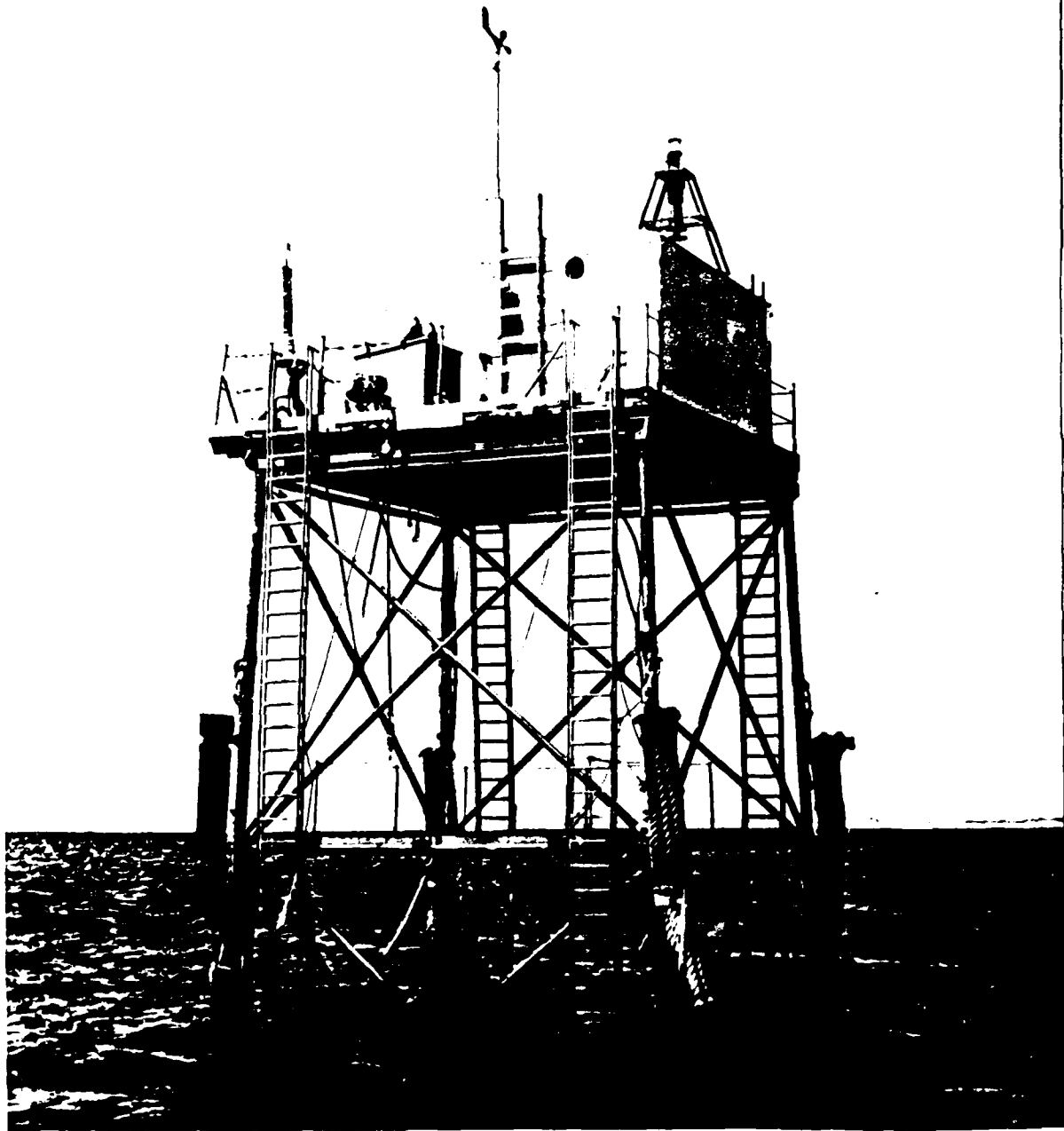
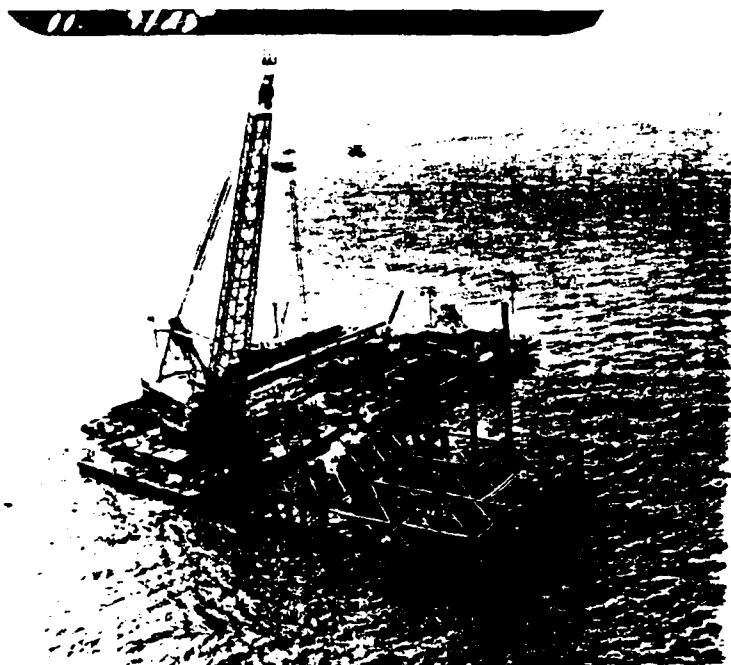


Figure 3. Photo of Platform At NCSC in the Early 1950's
(This platform was struck and destroyed by a barge
during a storm. The platform was later retrieved
for salvage.)



4a. Installation of Stage I Jacket (27 September 1957)
(A Hurricane Delayed Installation of the Decks)

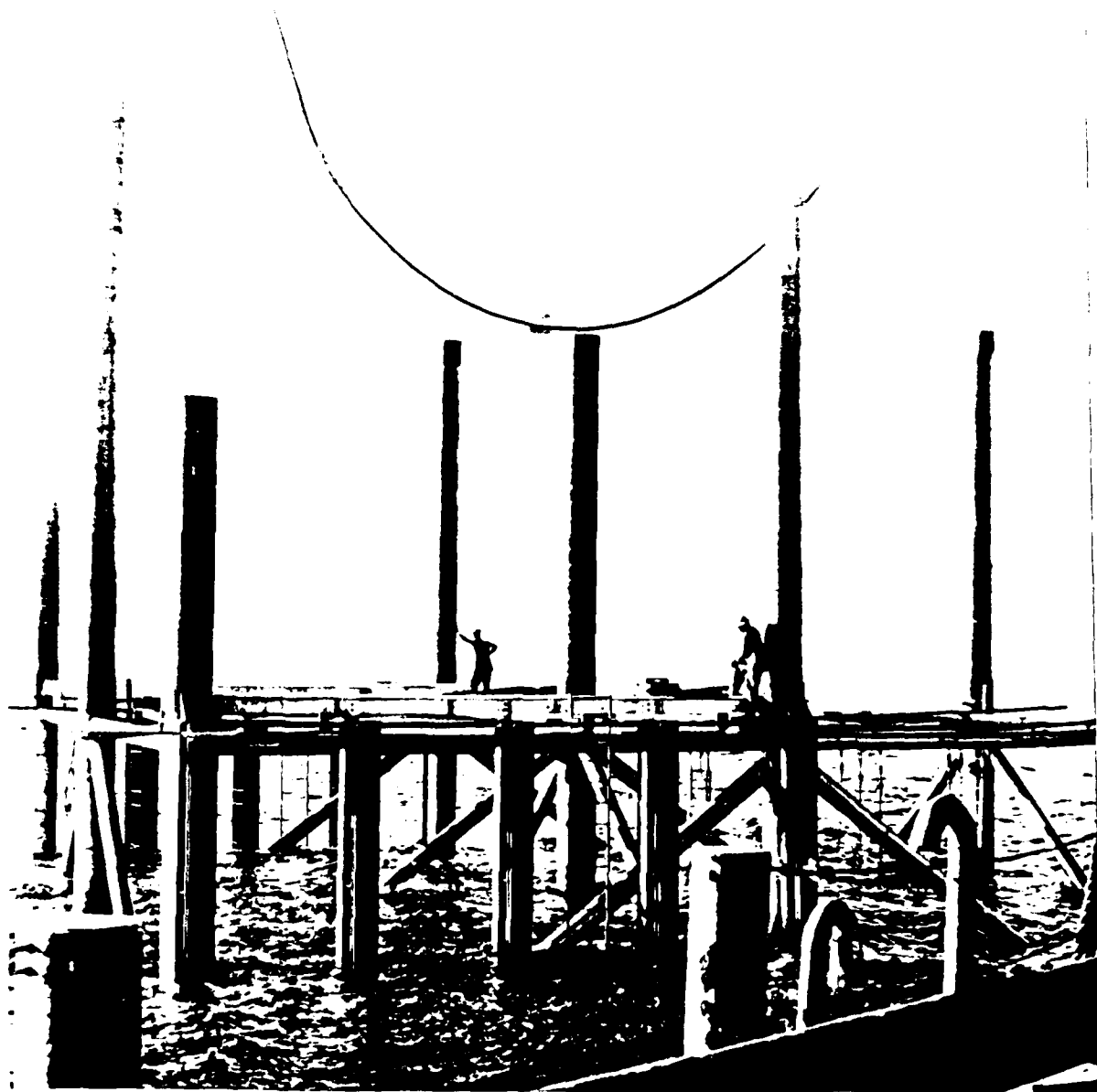


Figure 4b. Construction Photo of Stage II
(A Hurricane Delayed Installation of the Decks)

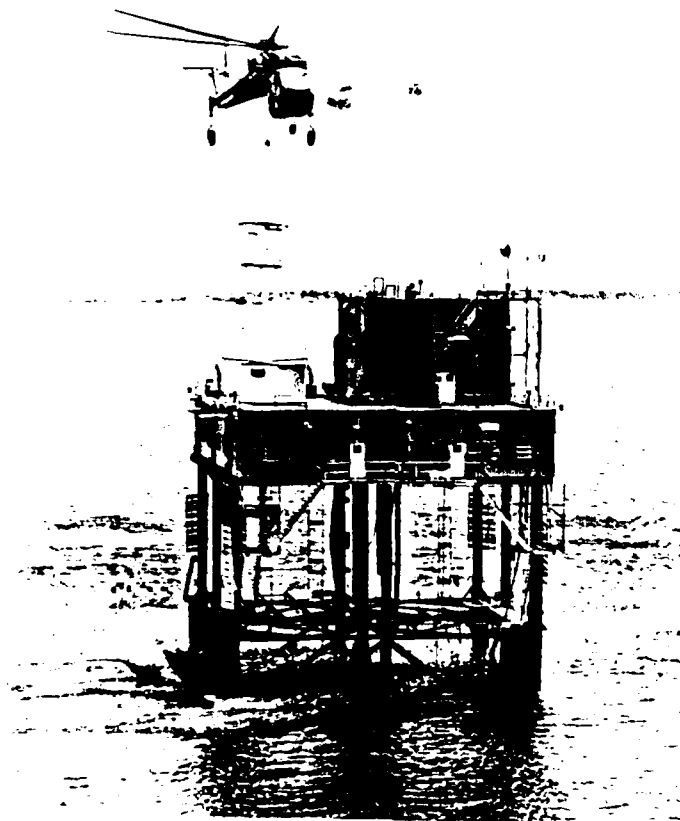
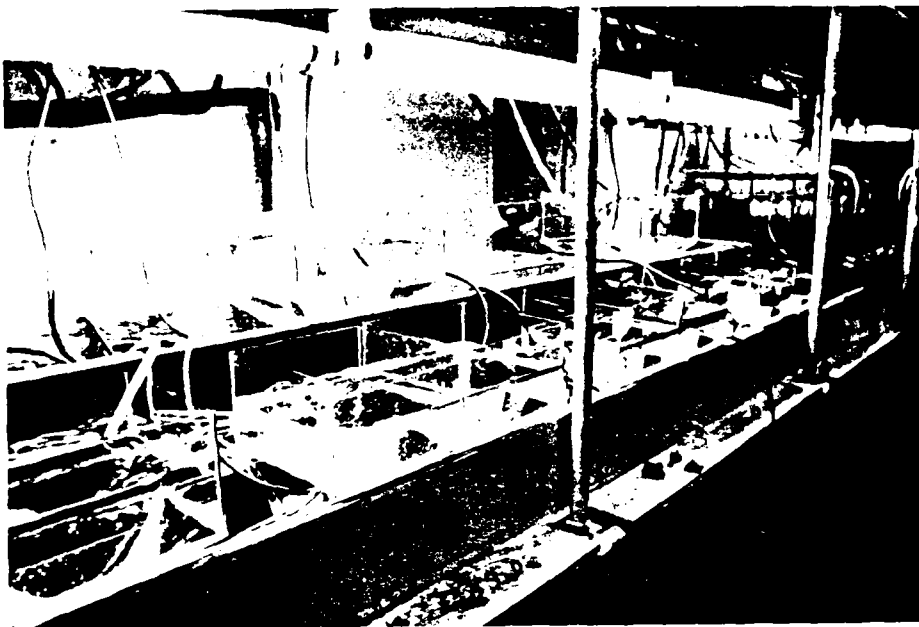
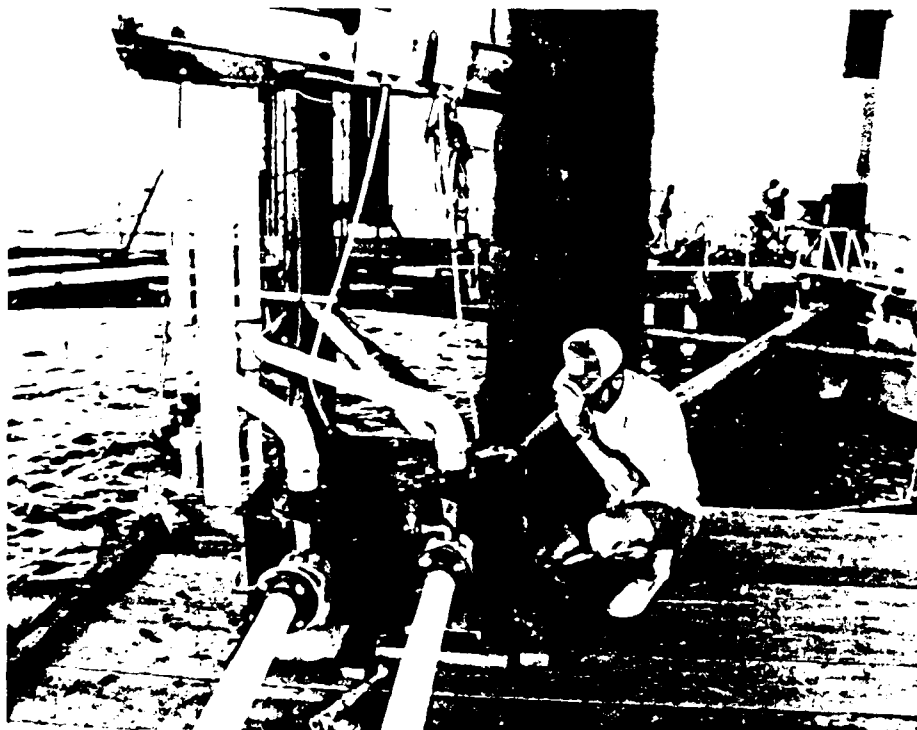


Figure 5. Military Helicopter Lifting Scientific Equipment on Stage II
(Date Unknown)



a) The Aquarium Room on Stage I



b) Checking the Flow Rate of Seawater to Biological Experiments

Figure 6. Photos of Environmental Experiments on Stage I

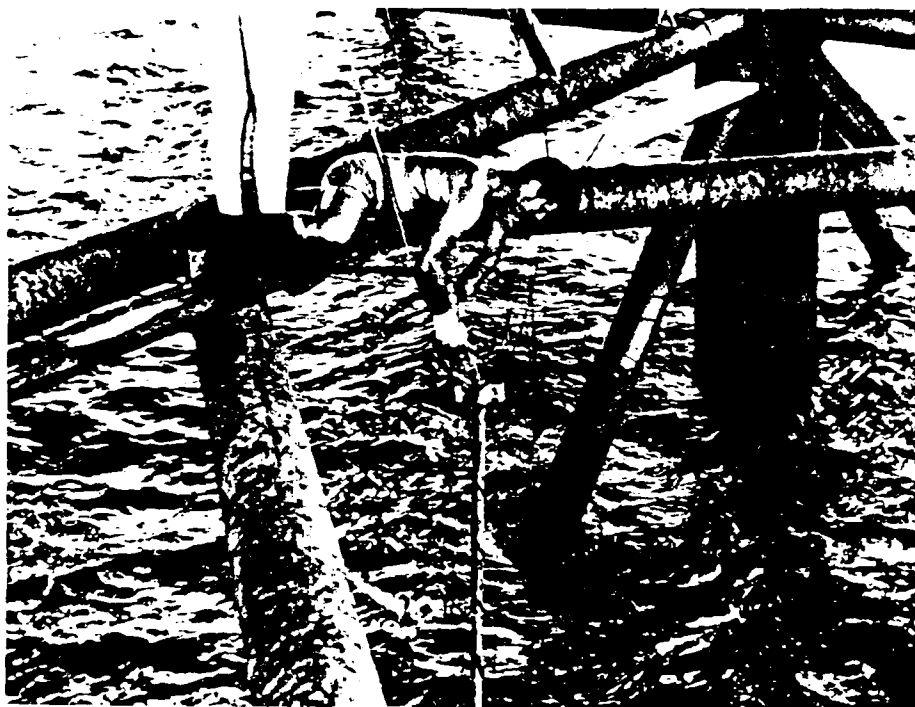


Figure 7. Installing a Wave Gage on Stage II

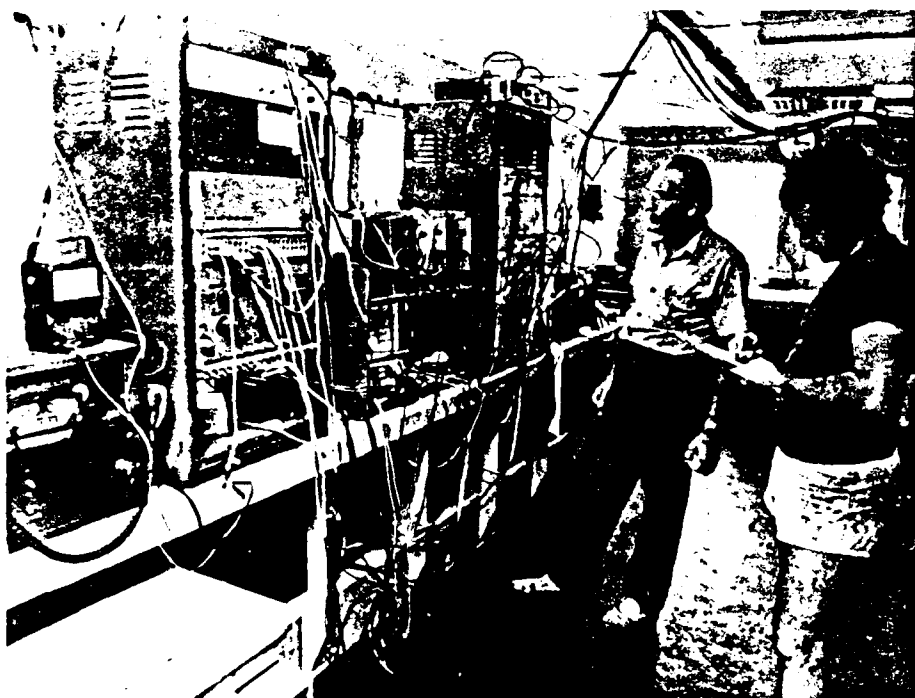
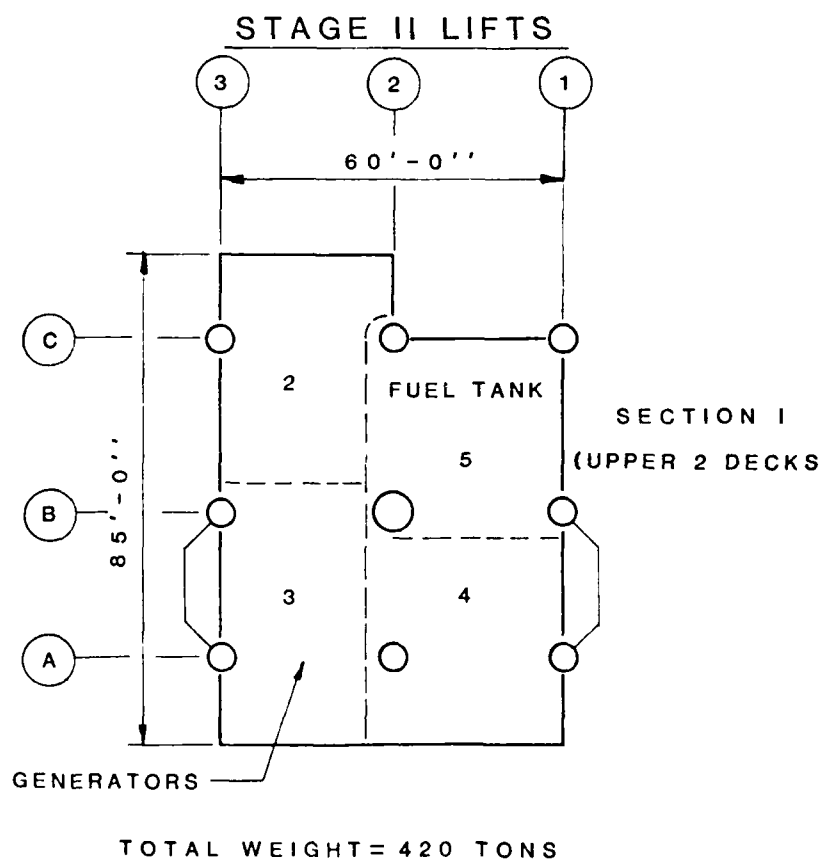
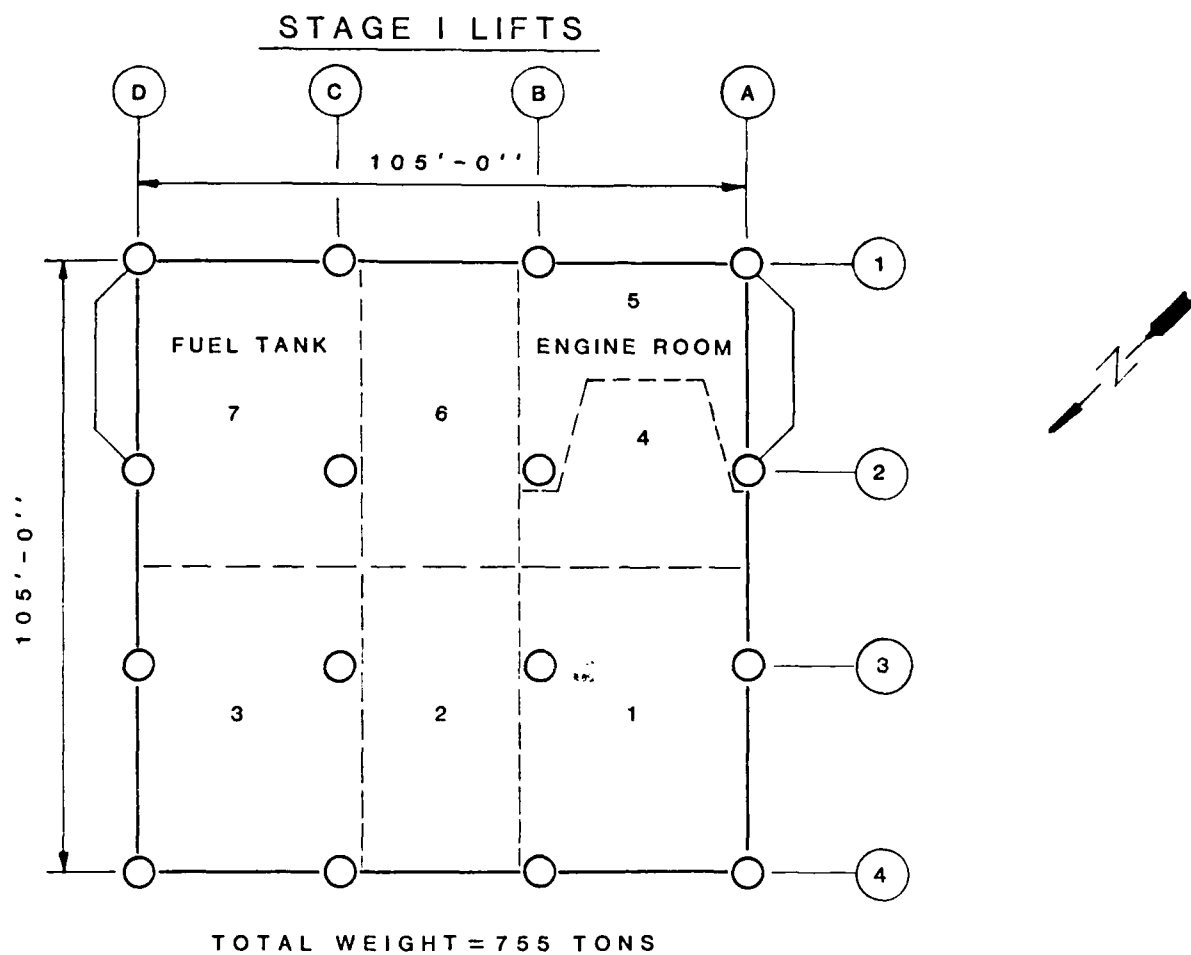


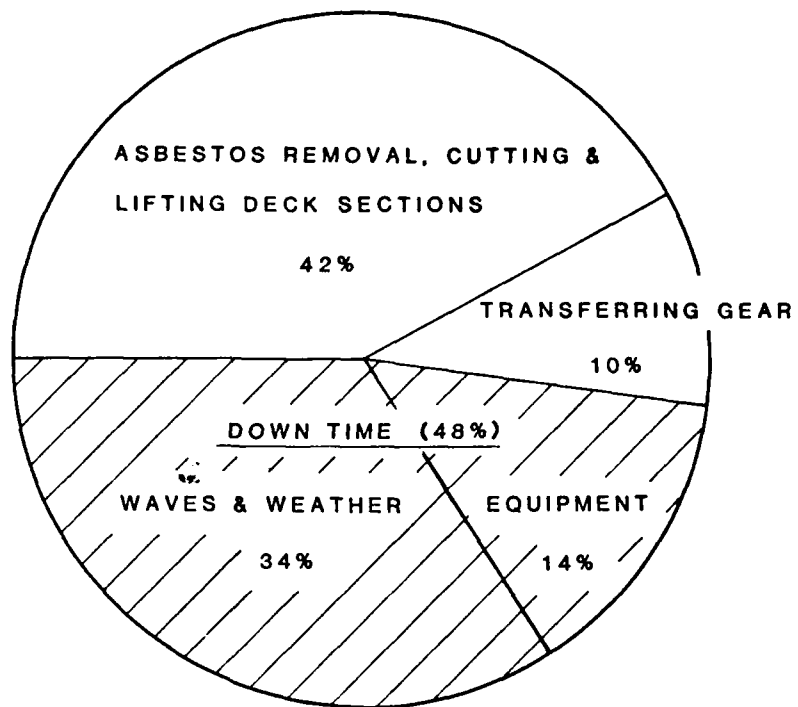
Figure 8. Monitoring Instrument Readings on Stage I



PLAN VIEWS OF THE STAGES ILLUSTRATING THE CUTTING PATTERN USED BY THE CONTRACTOR TO SECTION DECKS

PERCENT OF TIME

a) STAGE I
(32 DAYS)



b) STAGE II
(16 DAYS)

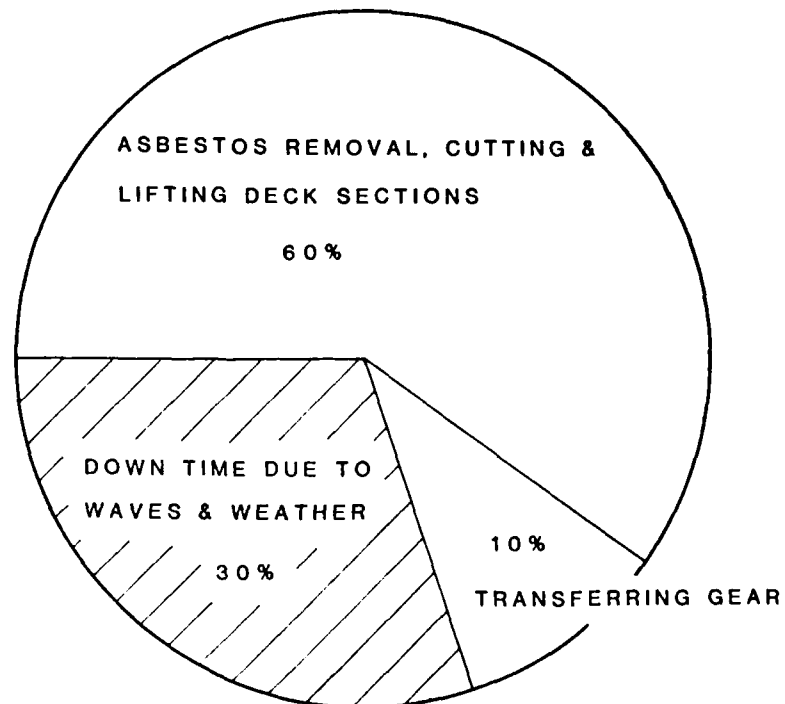


FIGURE 10. BREAKDOWN OF CONTRACTOR'S TIME ON SITE

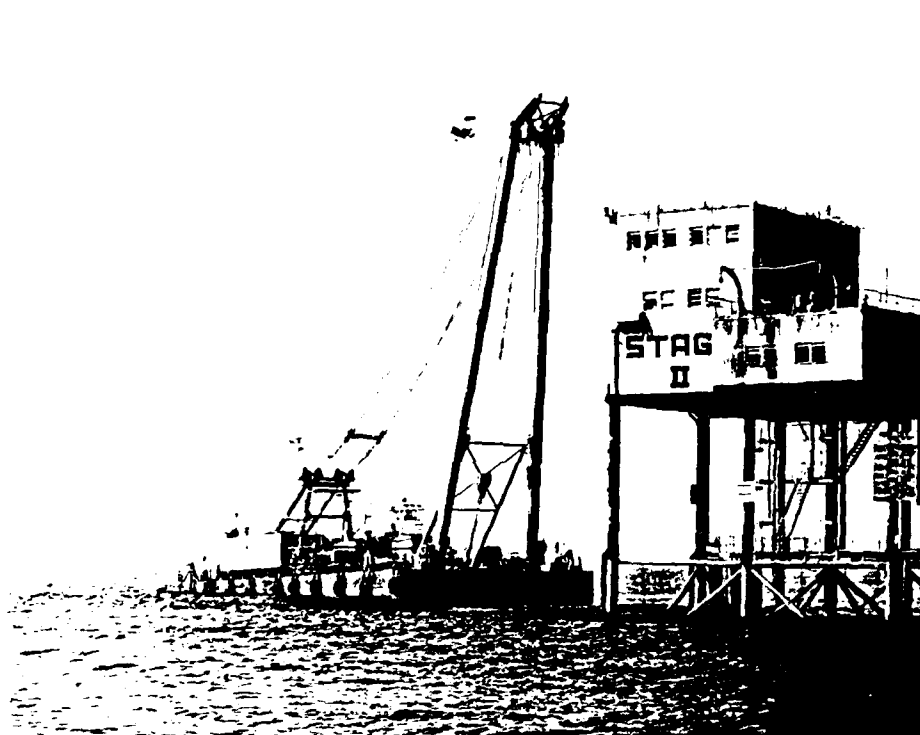


Figure 11. Photo of the Contractor's Barge (the "Sea Salvor")
(Two additional material barges were used to transport
equipment and sections of the stages)

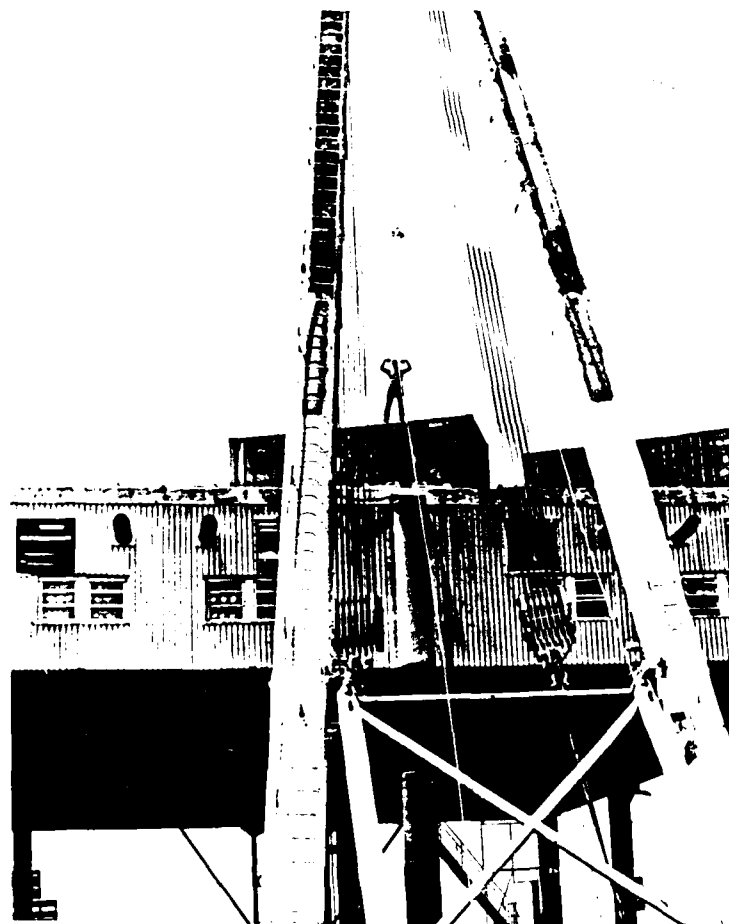
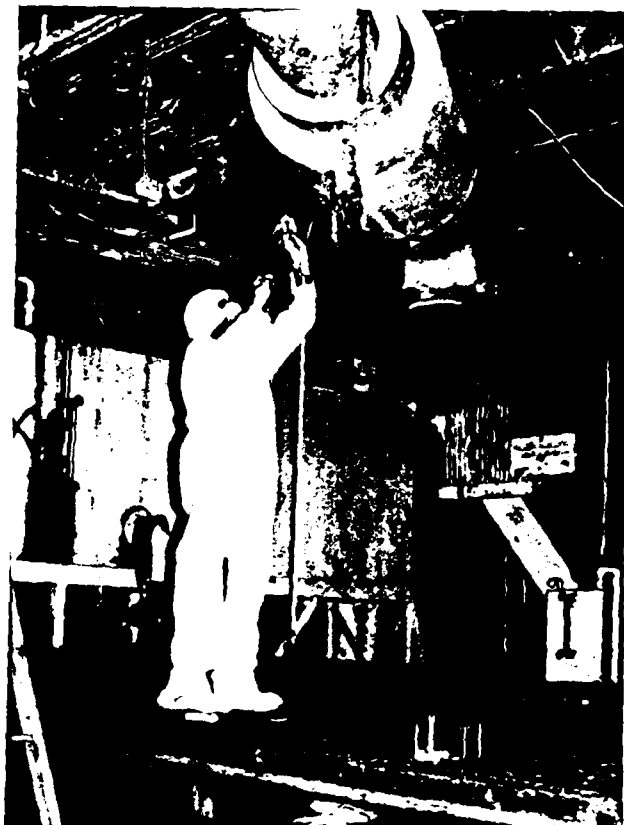


Figure 12. Photo of Lifting the Sub-Contractor's Containers of Asbestos Removal Gear on Stage I (containers included equipment, protective gear, a "clean room" with shower and were used to store and transport materials removed from the stages)

a) Removing Non-Friable
Ceiling Tiles



b) Sampling Friable Asbestos
Covering Mufflers
(friable material was removed
using the glove-bag method)

Figure 13. Photos Showing Asbestos Removal

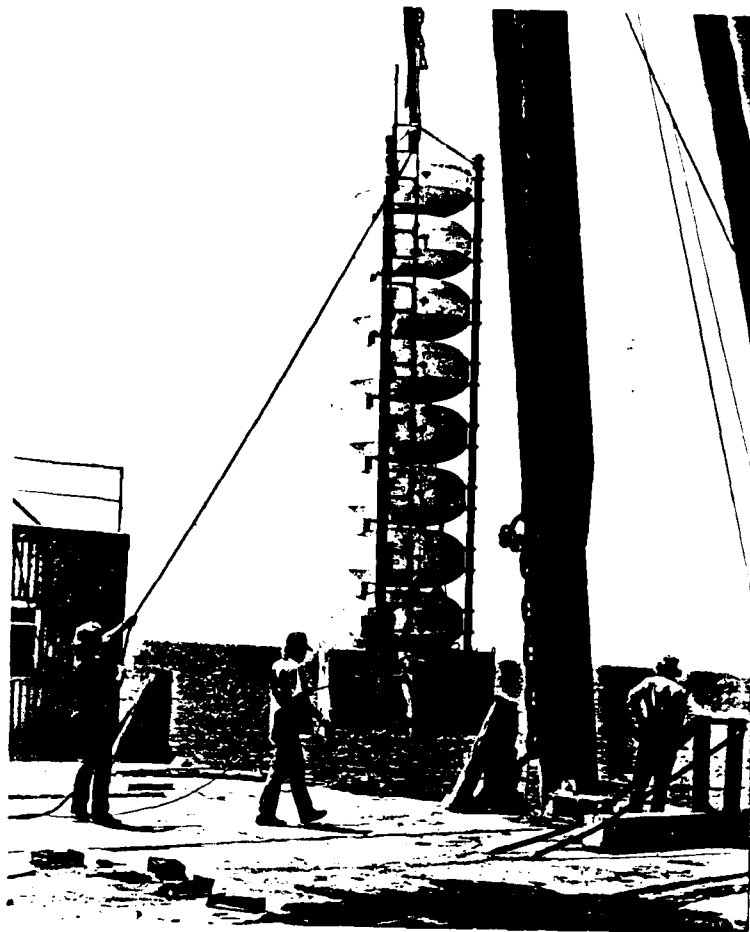


Figure 14. Removing the Foghorn from Stage I



Figure 15. Precutting the Decks of Stage I
(all but several key beams were cut)

Figure 16. Rigging Chain and Wire Rope Bridals (2" chain put around key beams with the aid of air tuggers; wire rope slings then shackled to chain)

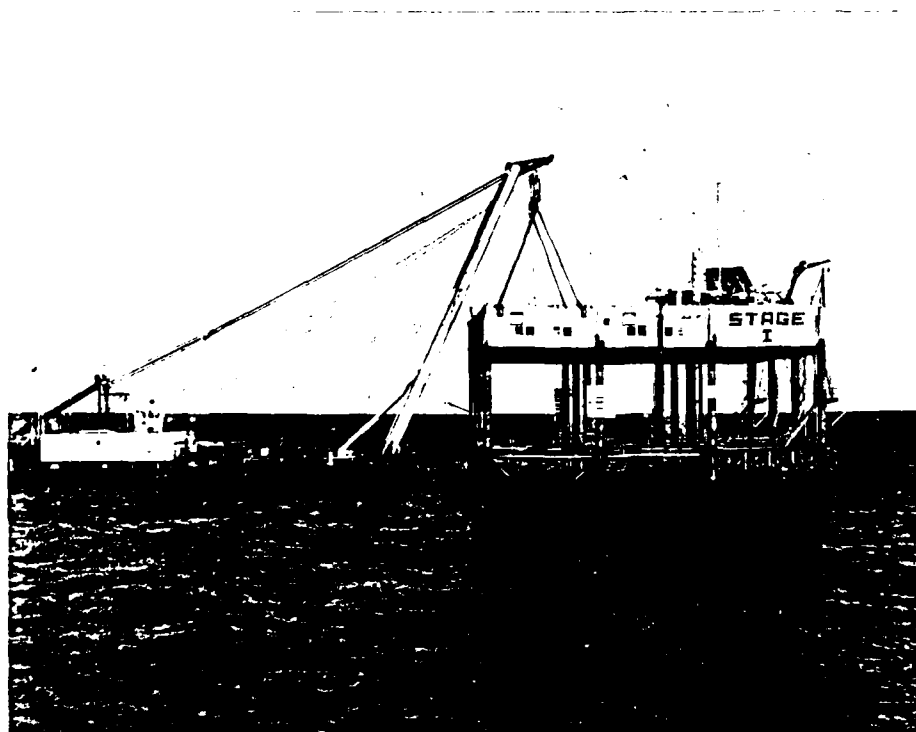
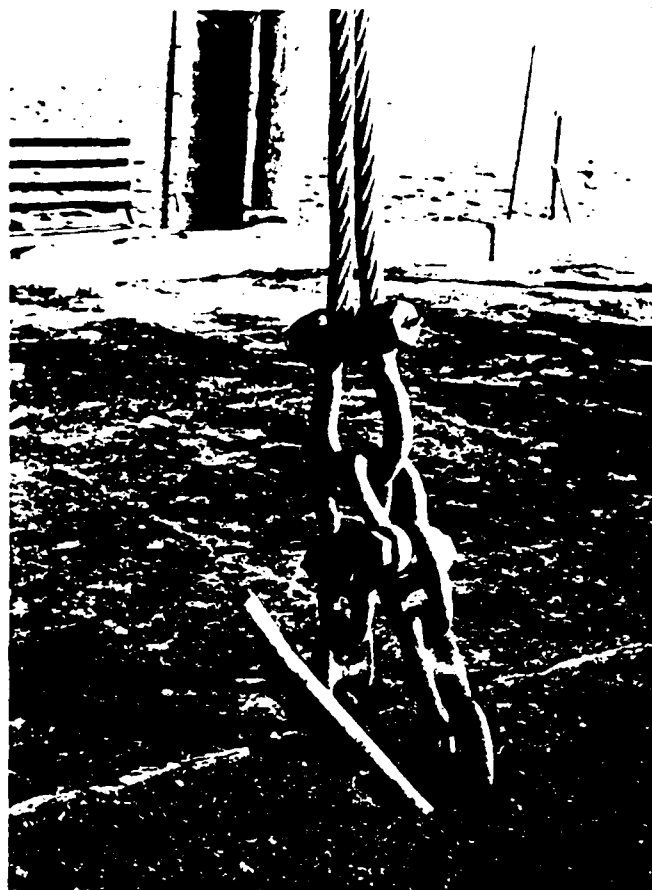


Figure 17. Contractor's Crane Provides Pretension to the Section Before Final Cuts and a Lift is Made



Figure 18. Supporting Legs are Last Items Cut Before a Lift is Made
(A 6" long section of circumference is not cut by the welders
on one pile; this "hangover" is torn off during lifting)

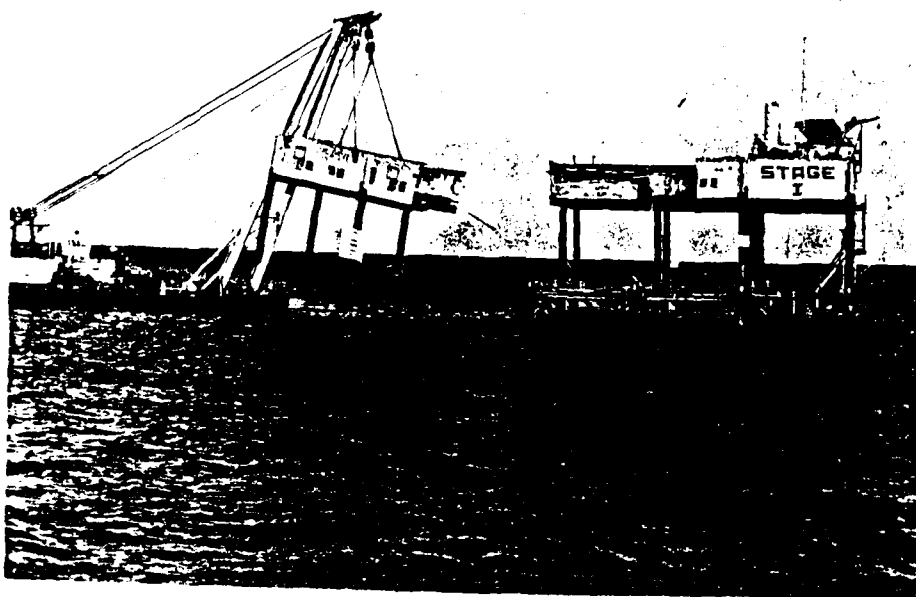
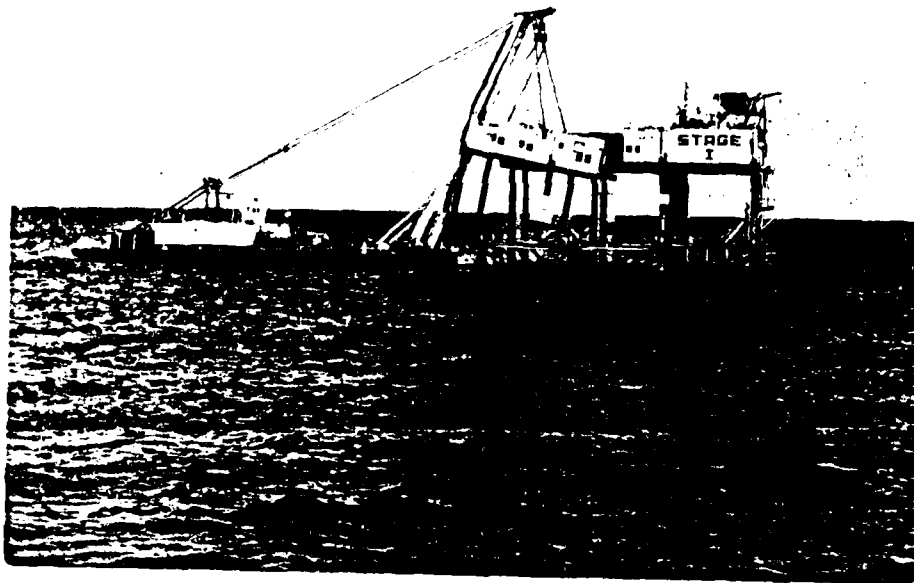


Figure 19. Lift of Section I Off Stage I
(9 July 1984, Section Weight = 105 tons)

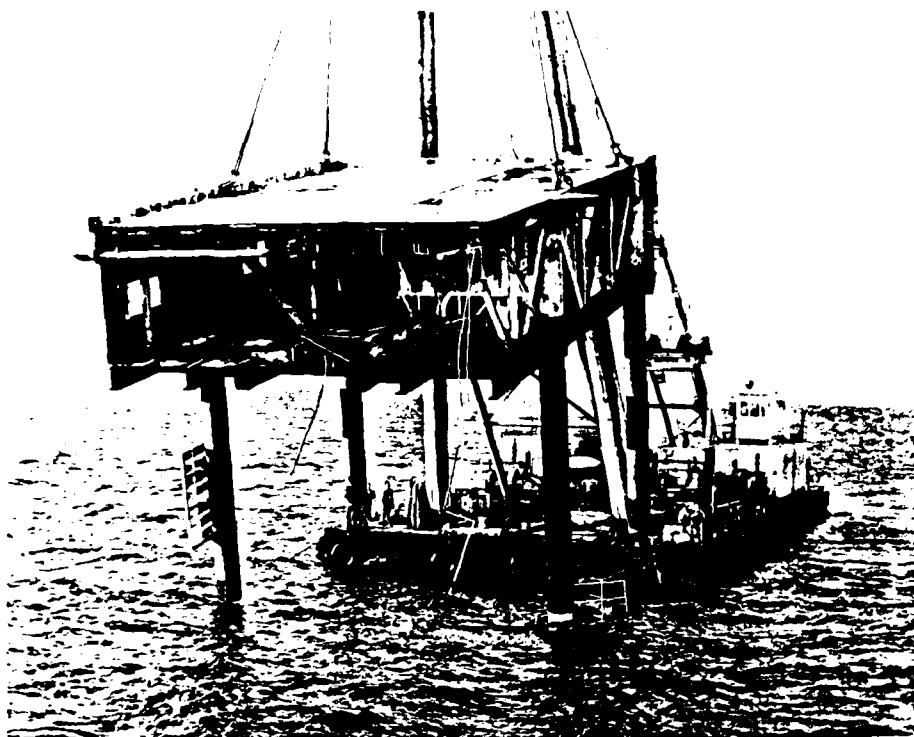


Figure 20. Closeup Photo of Section 1, Stage I

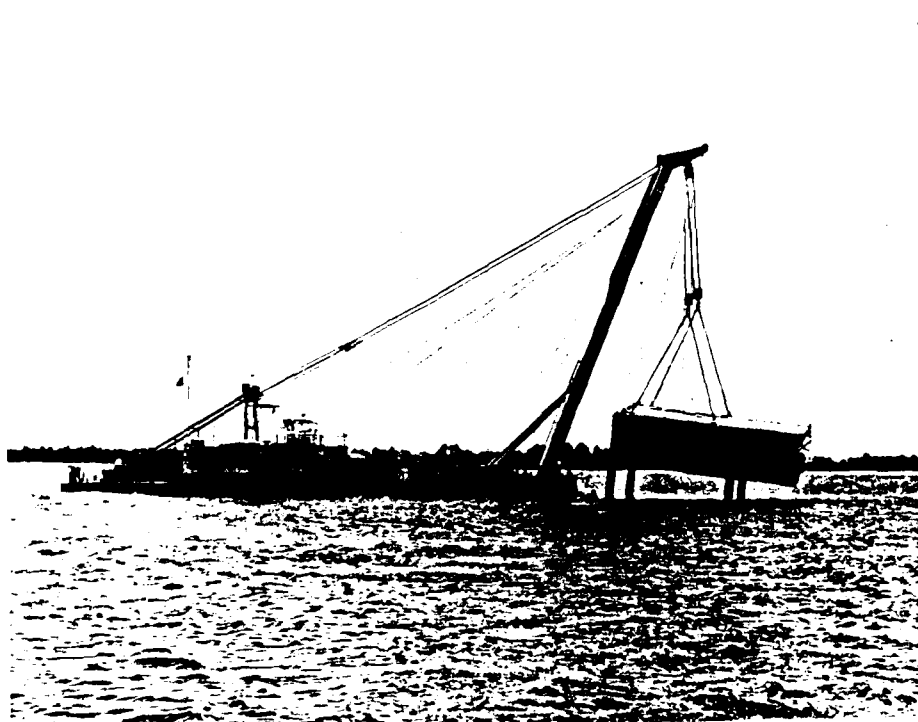


Figure 21. Photo of Section 1 Being Transported to the Bay
 (Note that sections were lowered with legs in the water
 during towing to reduce dynamic loads in the bridals)

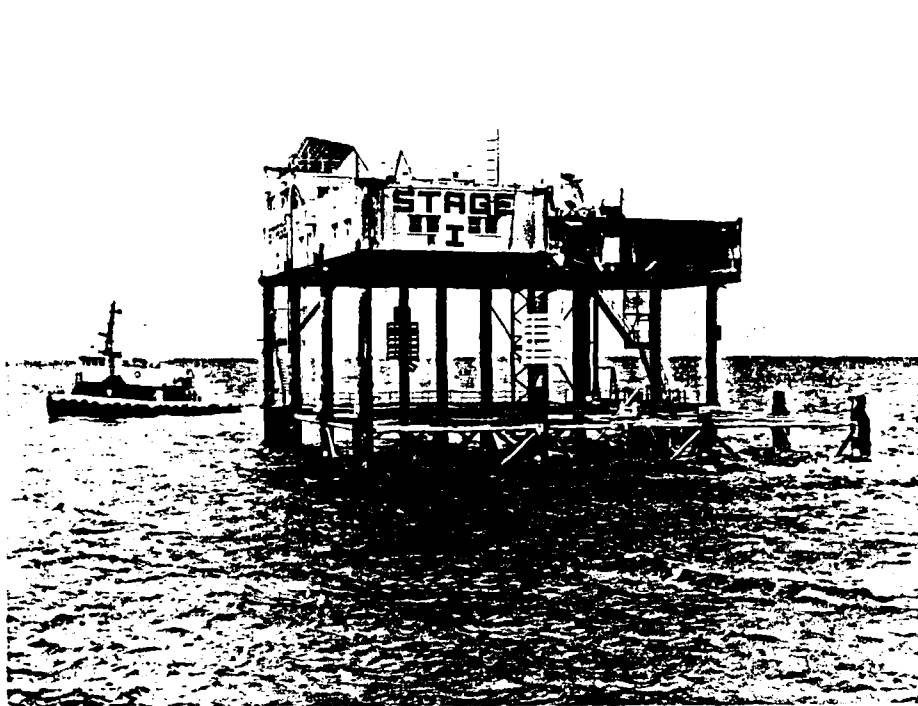


Figure 22. Photo of Stage I with Section 1 Removed

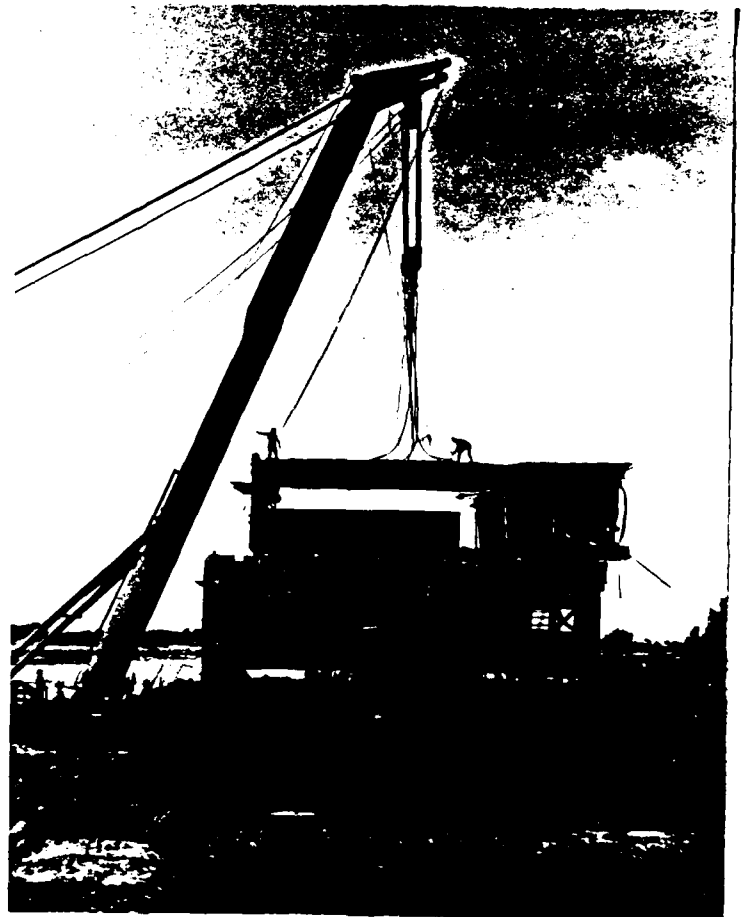


Figure 23. Unloading Section 2 (Stage I)
on Materials Barge
(Note that some sections were
stacked double-decker and then
welded together to save space)

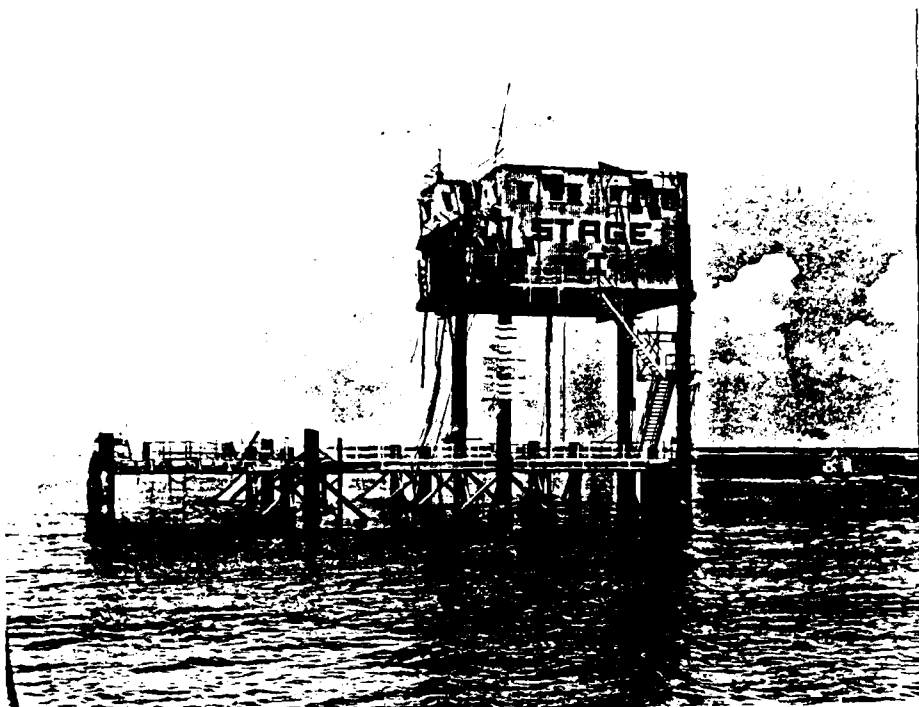


Figure 24. Stage I with Six Sections Removed

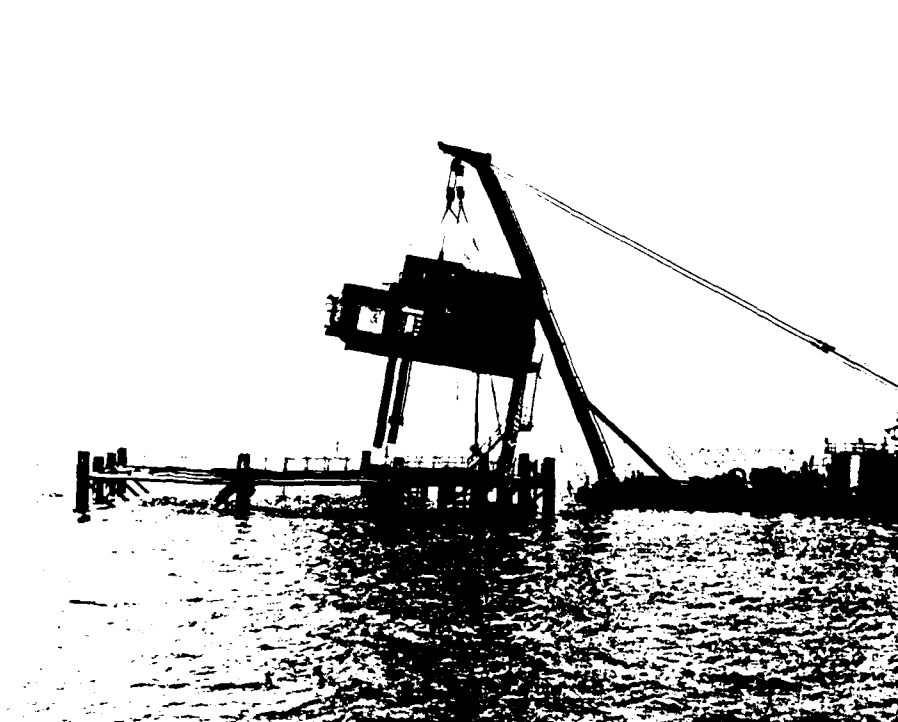


Figure 25. Lifting Section 7 Off Stage I
(28 July 1984, this was the
fuel tank, weight = 200 tons)

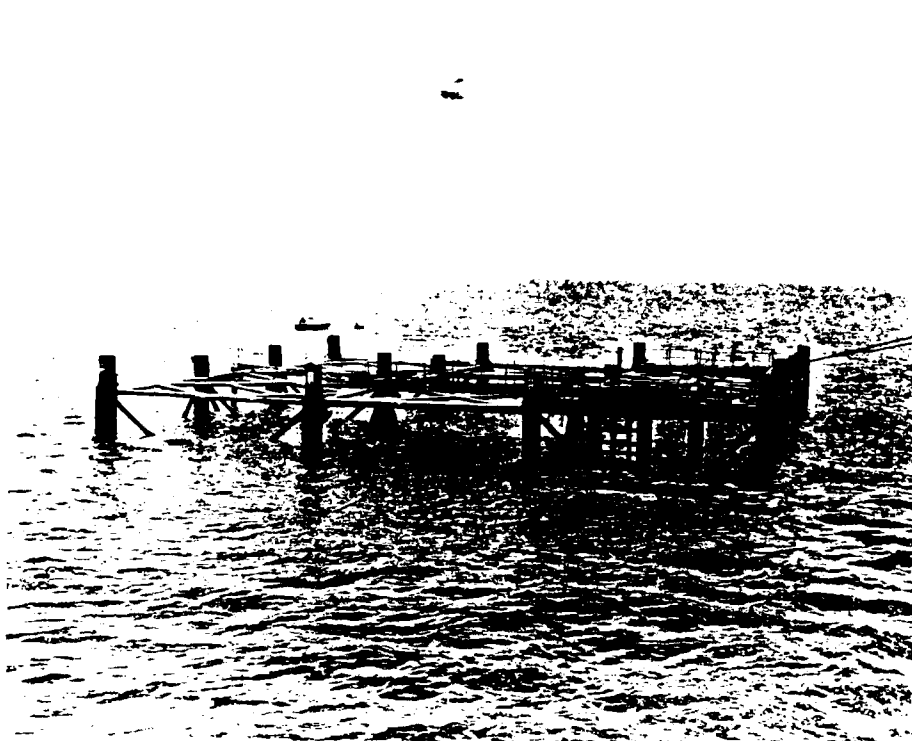


Figure 26. Stage I Jacket with Deck Removed
(A temporary navigation light was
installed soon after this photo
was taken. This completed the
Contractor's work on Stage I.)



Figure 27. Solar Panel Being Removed from Stage II)
(5 August 1984)



Figure 28. Section I (Upper Two Decks) Being Removed from
Stage II (5 August 1984, weight = 60 tons)

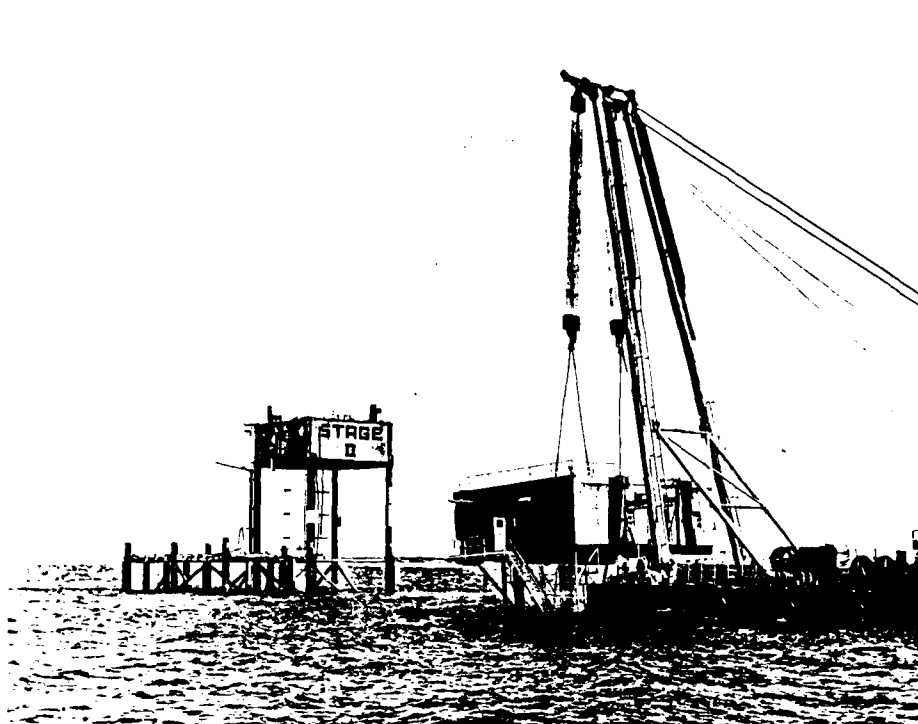


Figure 29. Section 4 Being Removed from Stage II
(8 August 1984, section weight = 110 tons)

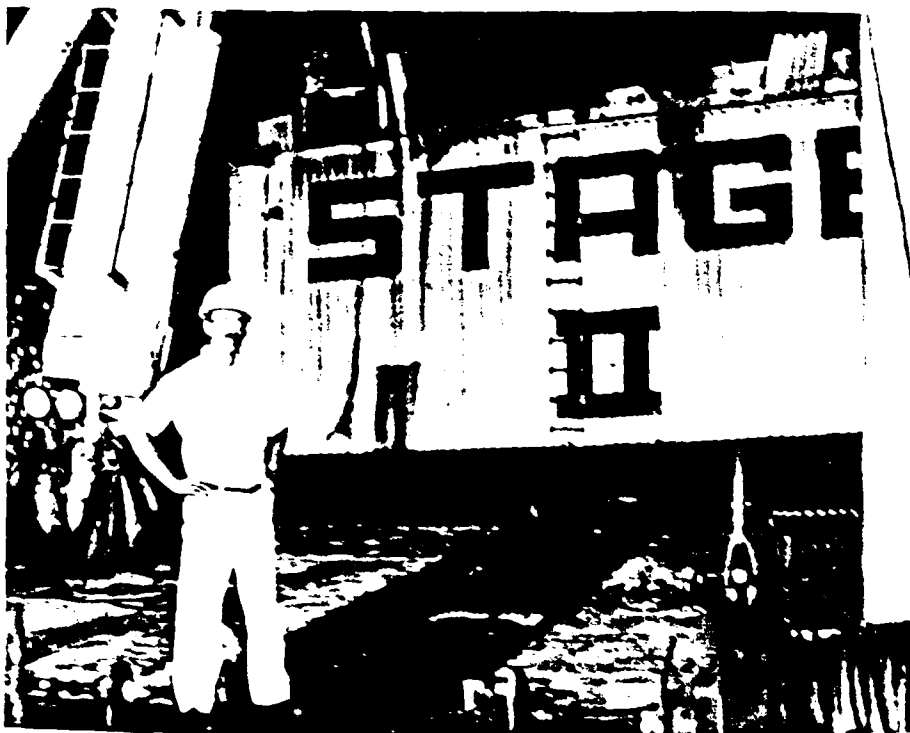


Figure 30. The Last Section from Stage II Being Towed to the Bay
(8 August 1984, section weight = 110 tons)

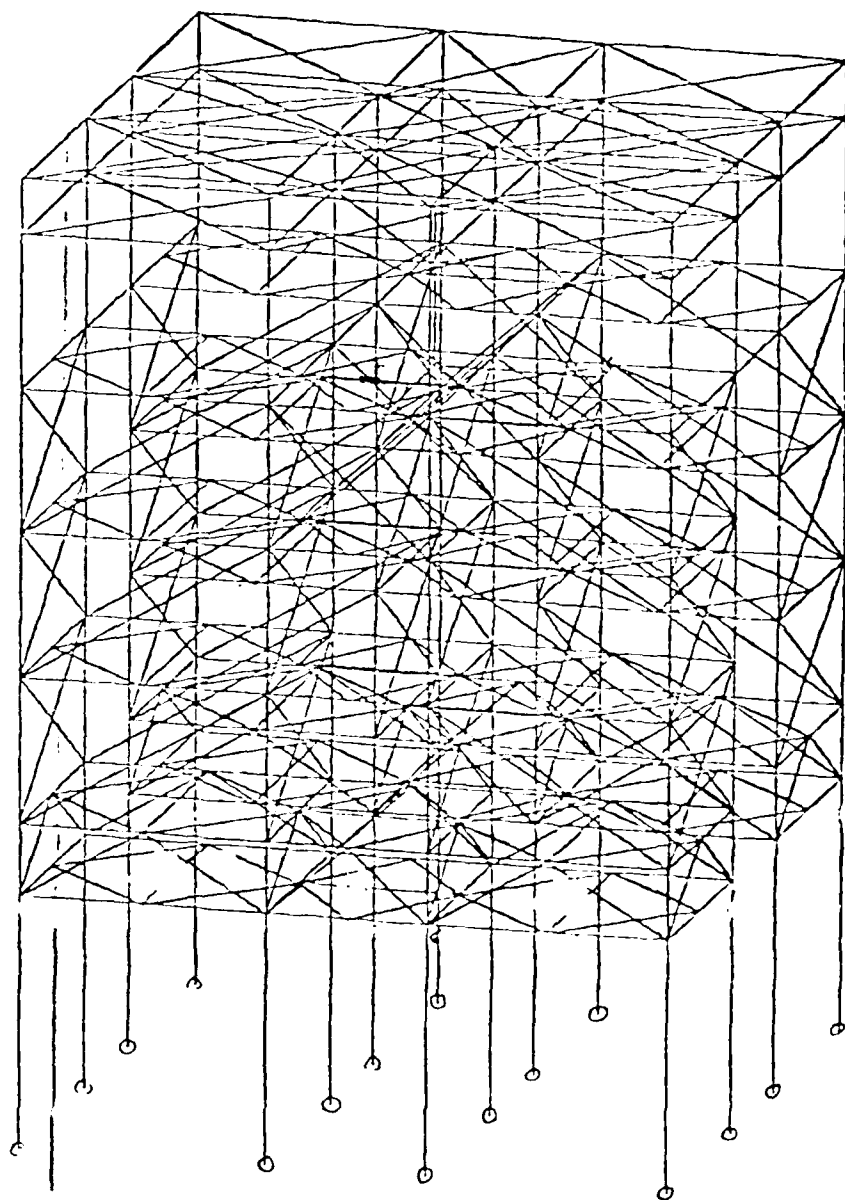


Figure 31. Computer Plot of Stage I

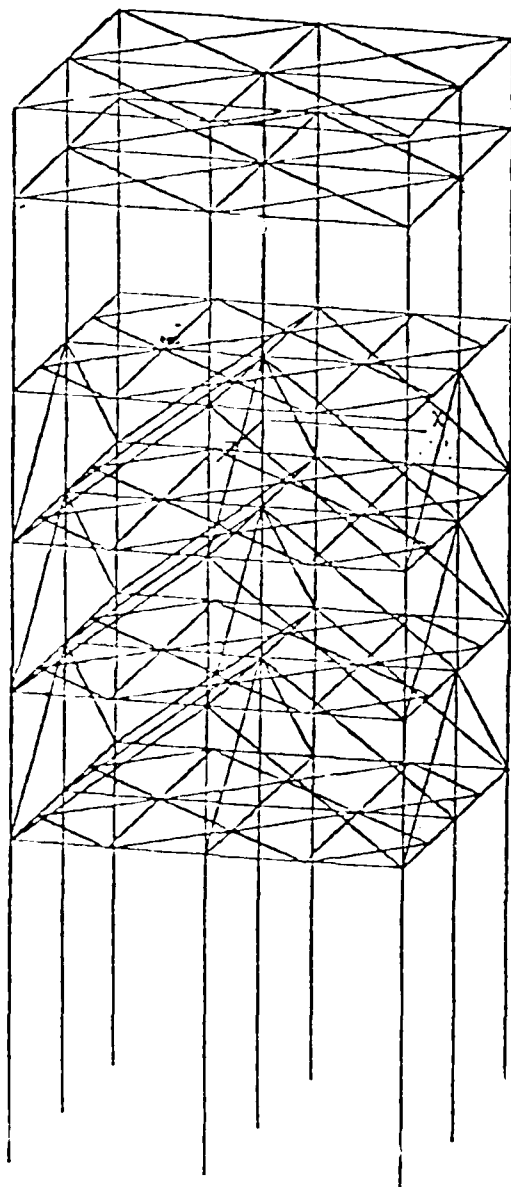
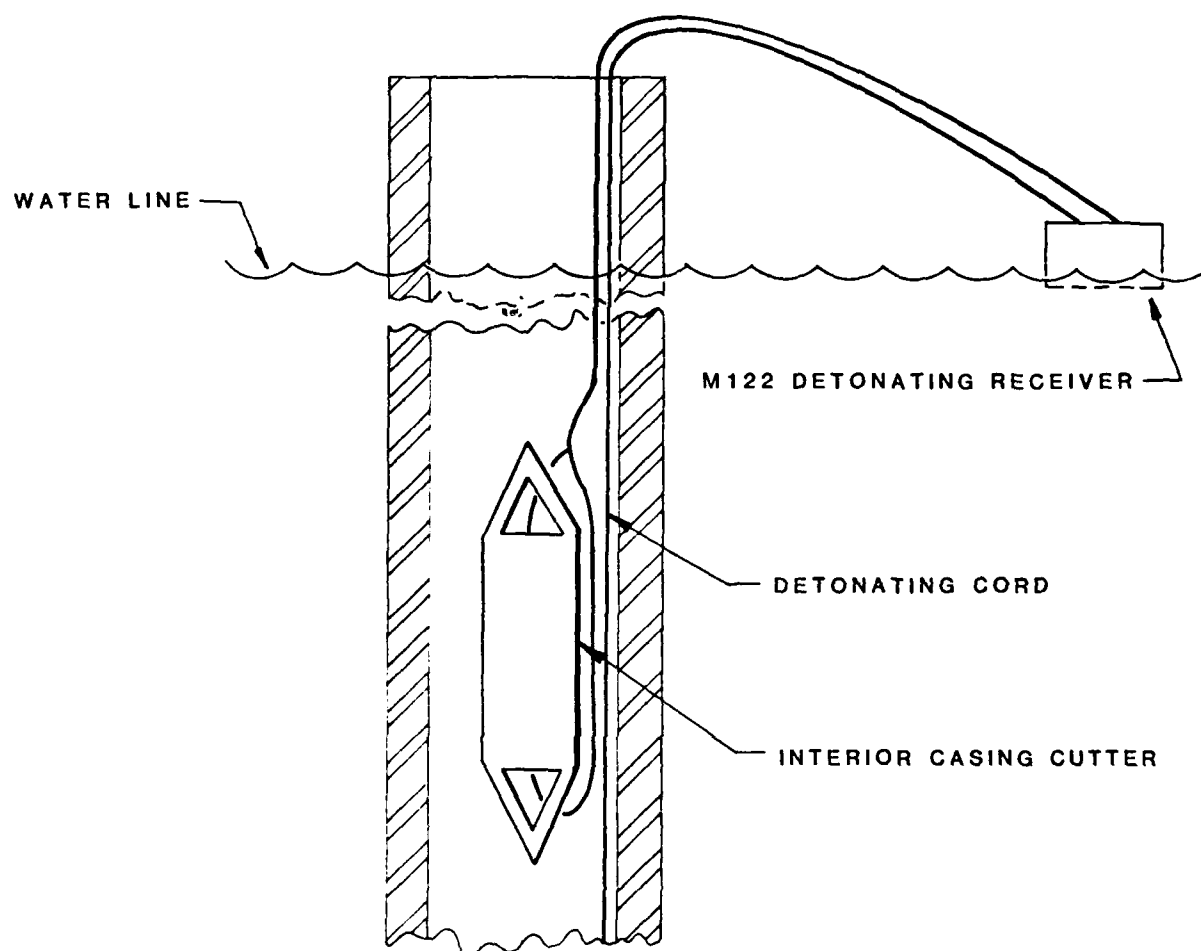


Figure 32. Computer Plot of Stage II



SAMPLE PLACEMENT OF A CONTAINER OF NM/DETA

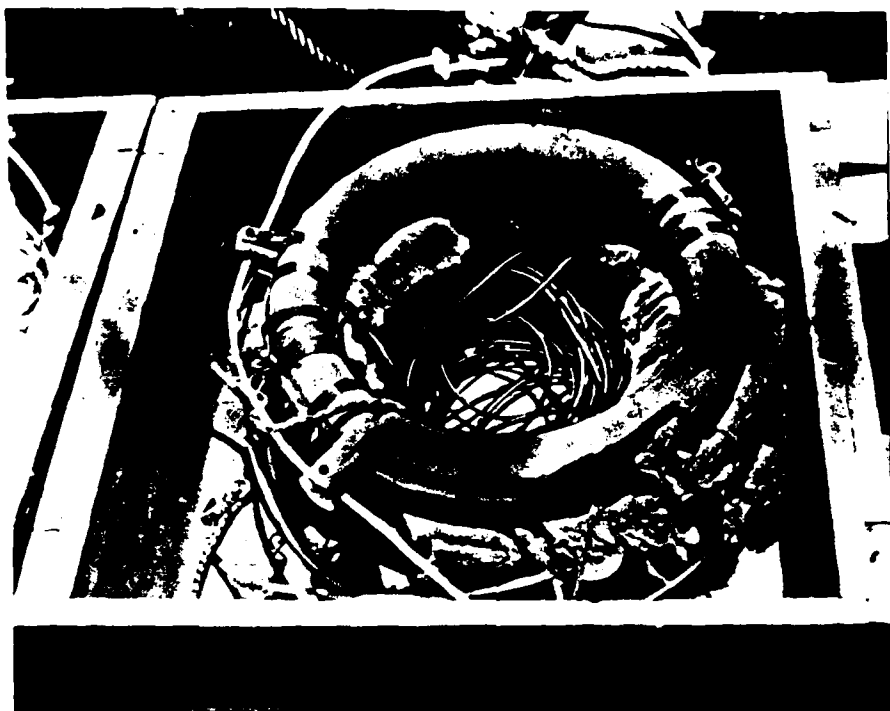


Figure 34. A Shaped Circular Charge

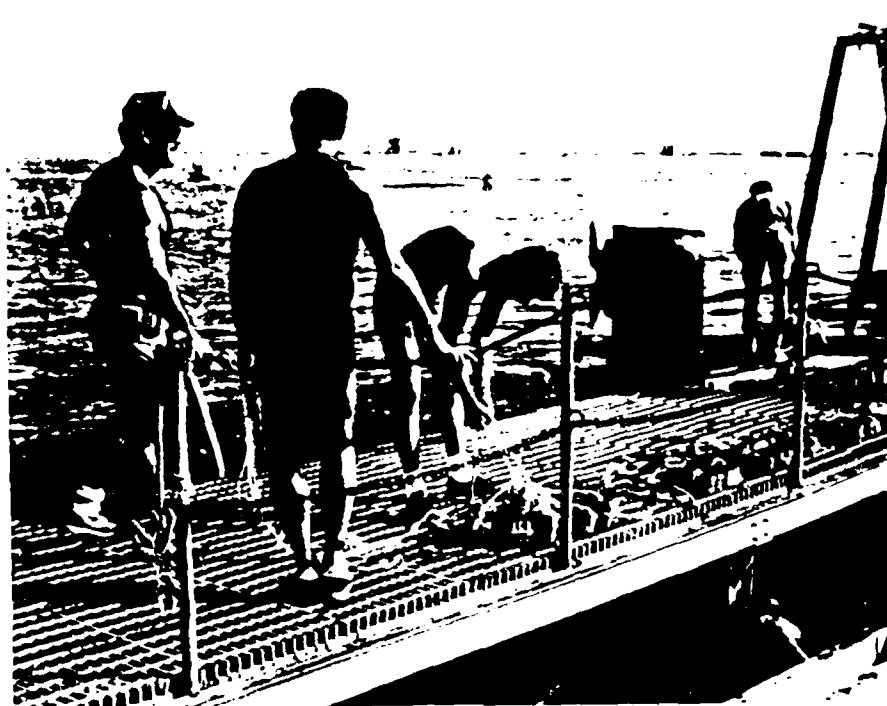


Figure 35. C-4 (RDK) Plastic Charges Being Loaded)

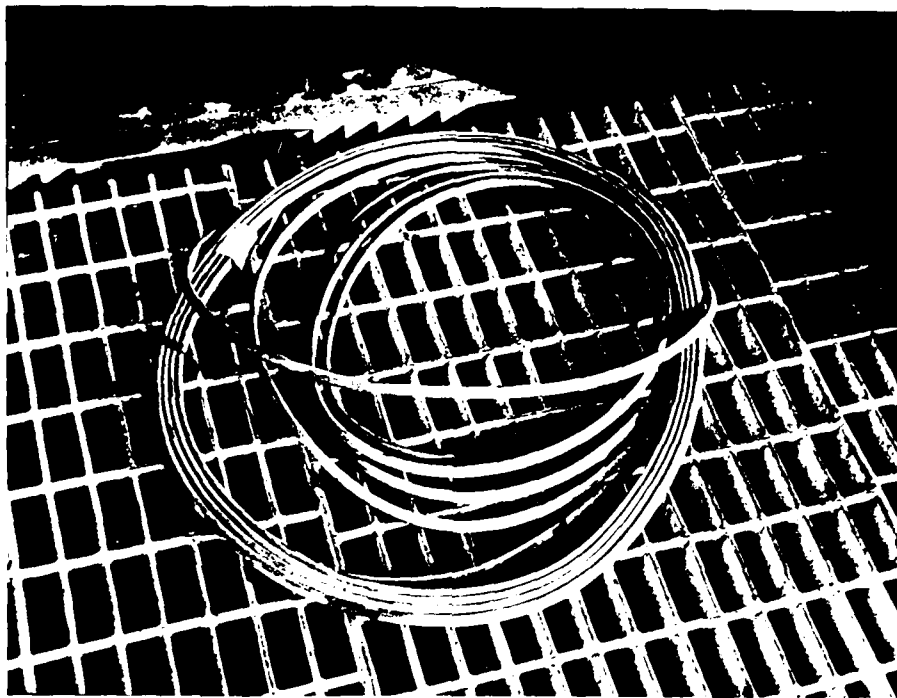


Figure 36. Flexible Linear Shaped Charges



Figure 37. Transmitter Used for Demolition

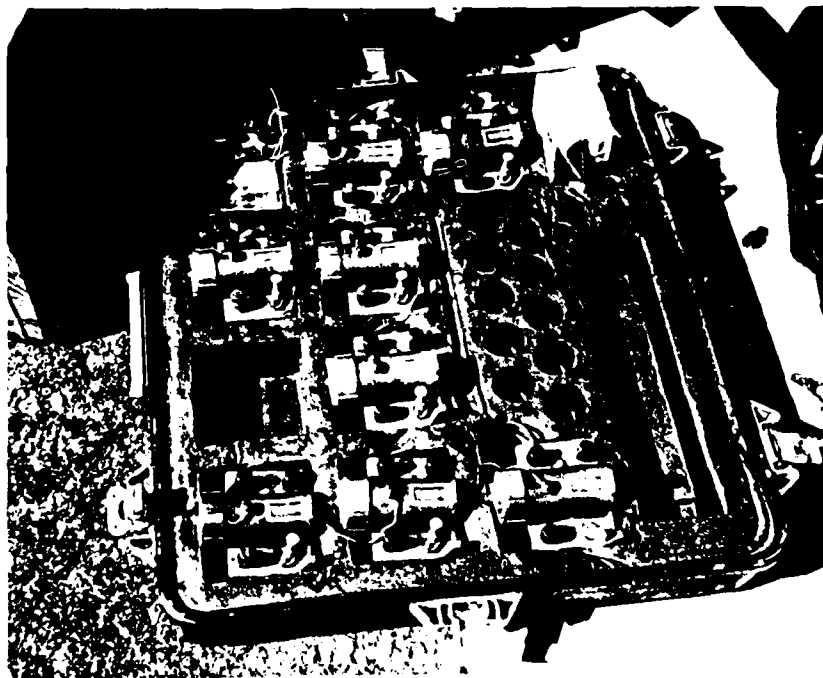
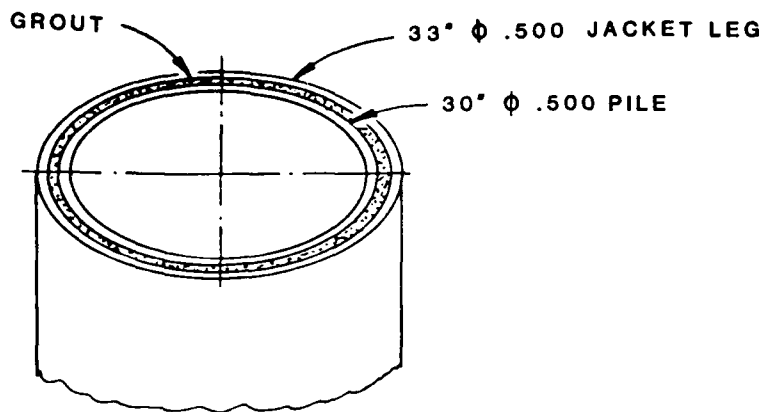


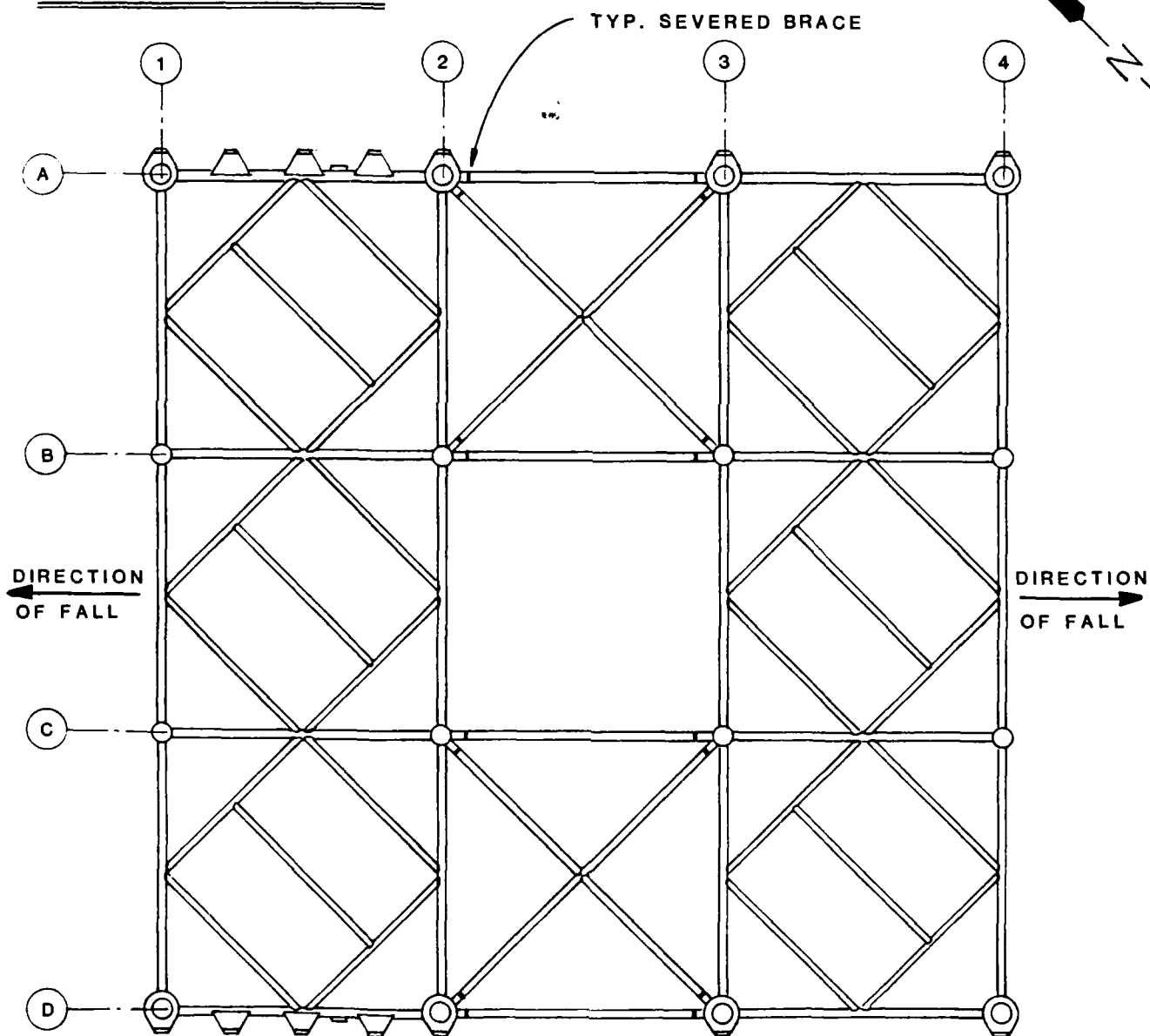
Figure 38. Demolition Signal Receivers



TYPICAL LEG DETAIL

DEMOLITION SEQUENCE

- 1) SEVERED CONNECTING BRACES
- 2) TOPPLED ROWS 1 & 2
- 3) TOPPLED ROWS 3 & 4



TYPICAL HORIZONTAL FRAMING PLAN
STAGE I - LOCATION OF CHARGES

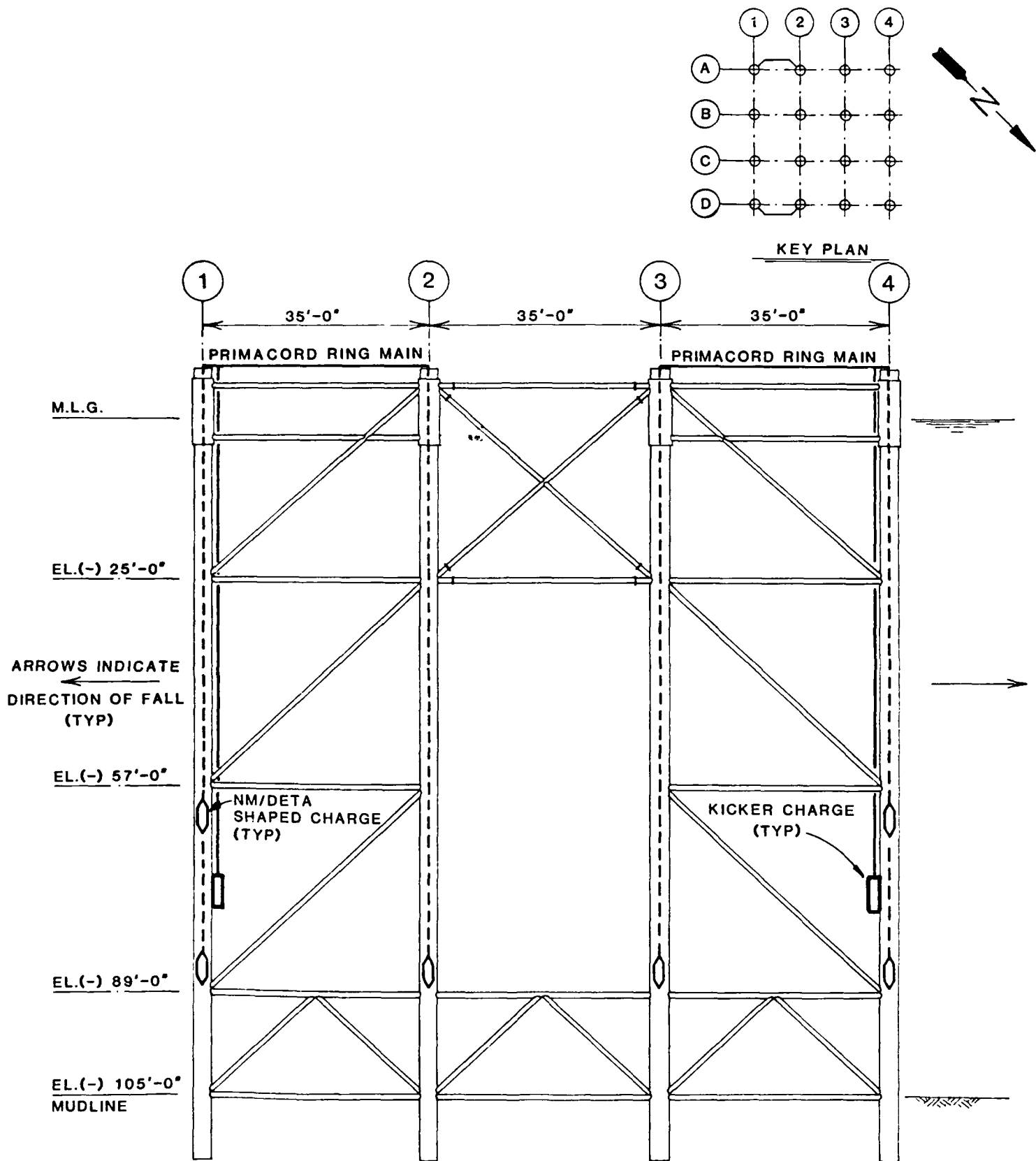


FIGURE 40

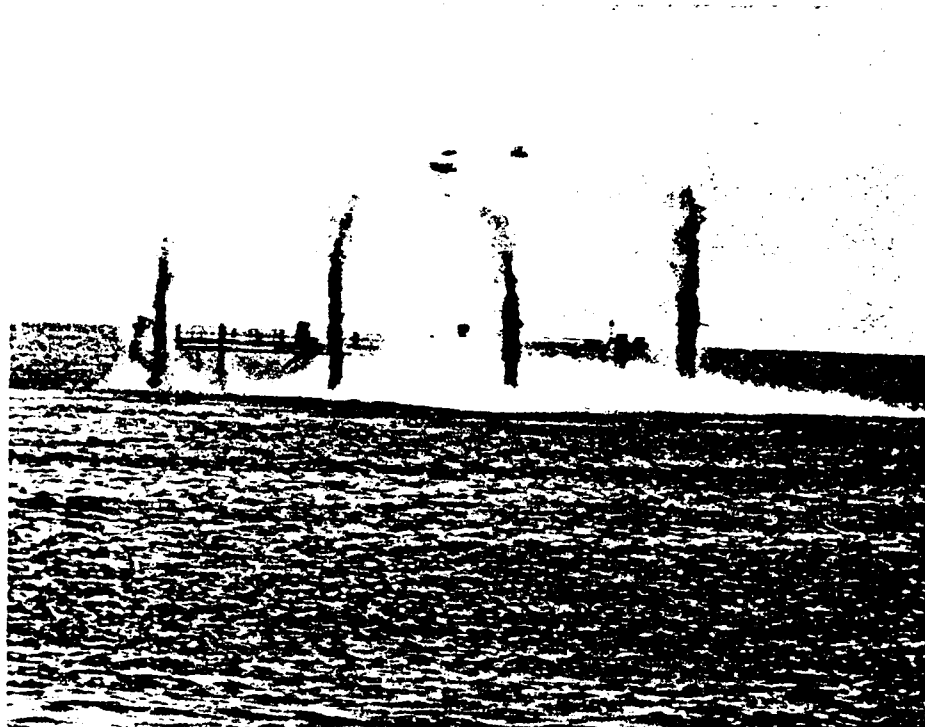
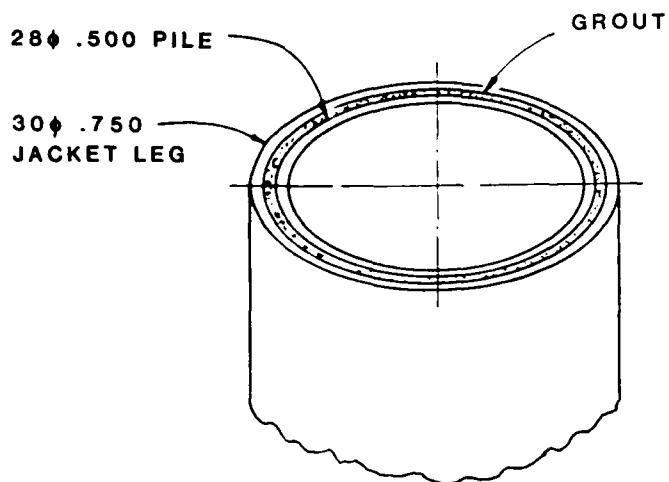
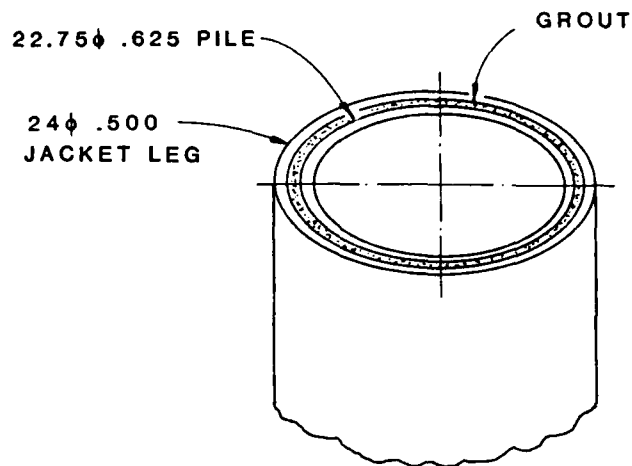


Figure 41. Demolition of the Northern Jacket of Stage I

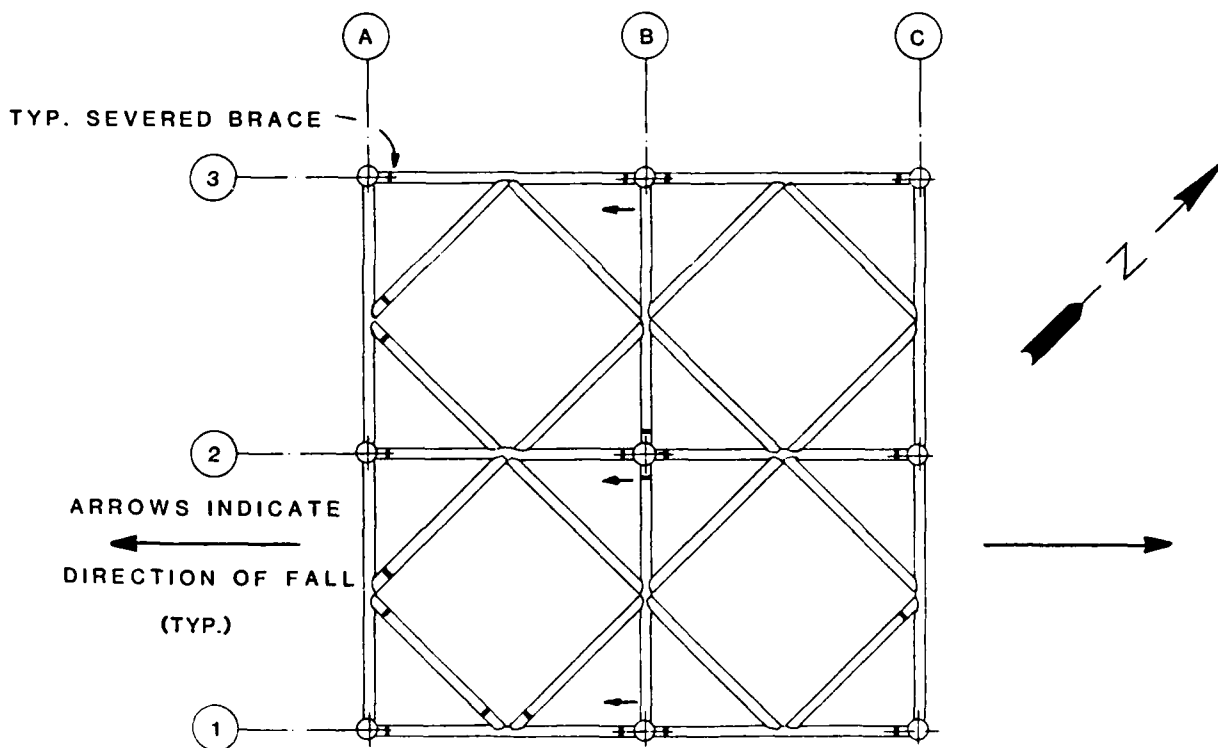


INTERIOR LEG



EXTERIOR LEGS

TYPICAL LEG DETAILS

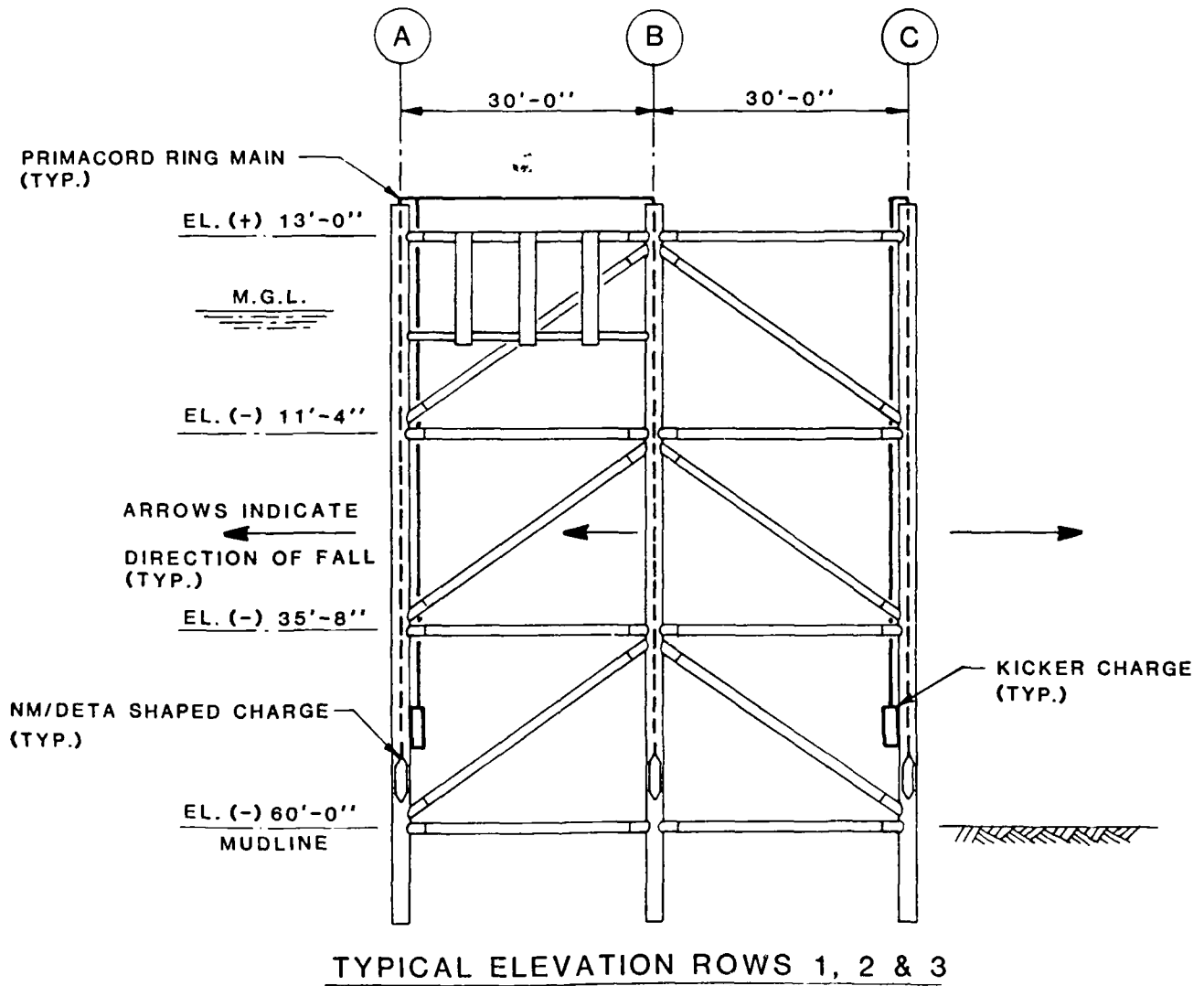
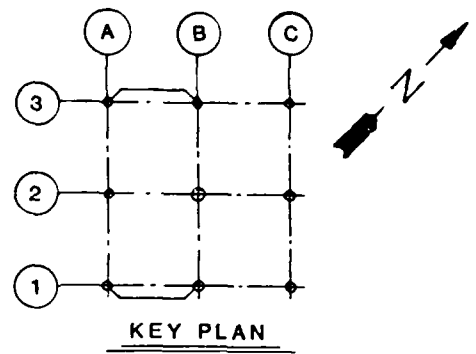


TYPICAL HORIZONTAL FRAMING PLAN

STAGE II - LOCATION OF CHARGES

DEMOLITION SEQUENCE:

- 1) SEVERED CONNECTING BRACES
- 2) TOPPLED ROW C, PULLED WITH LCM-8
- 3) TOPPLED ROWS A & B, PULLED WITH LCM-8



STAGE II LOCATION OF CHARGES



Figure 44. Demolition Shot on Stage II

SUMMARY SCHEDULE

DECK CLEANUP & REMOVAL / JACKET DEMOLITION
STAGES I & II, NCSC, PANAMA CITY, FLORIDA

1984

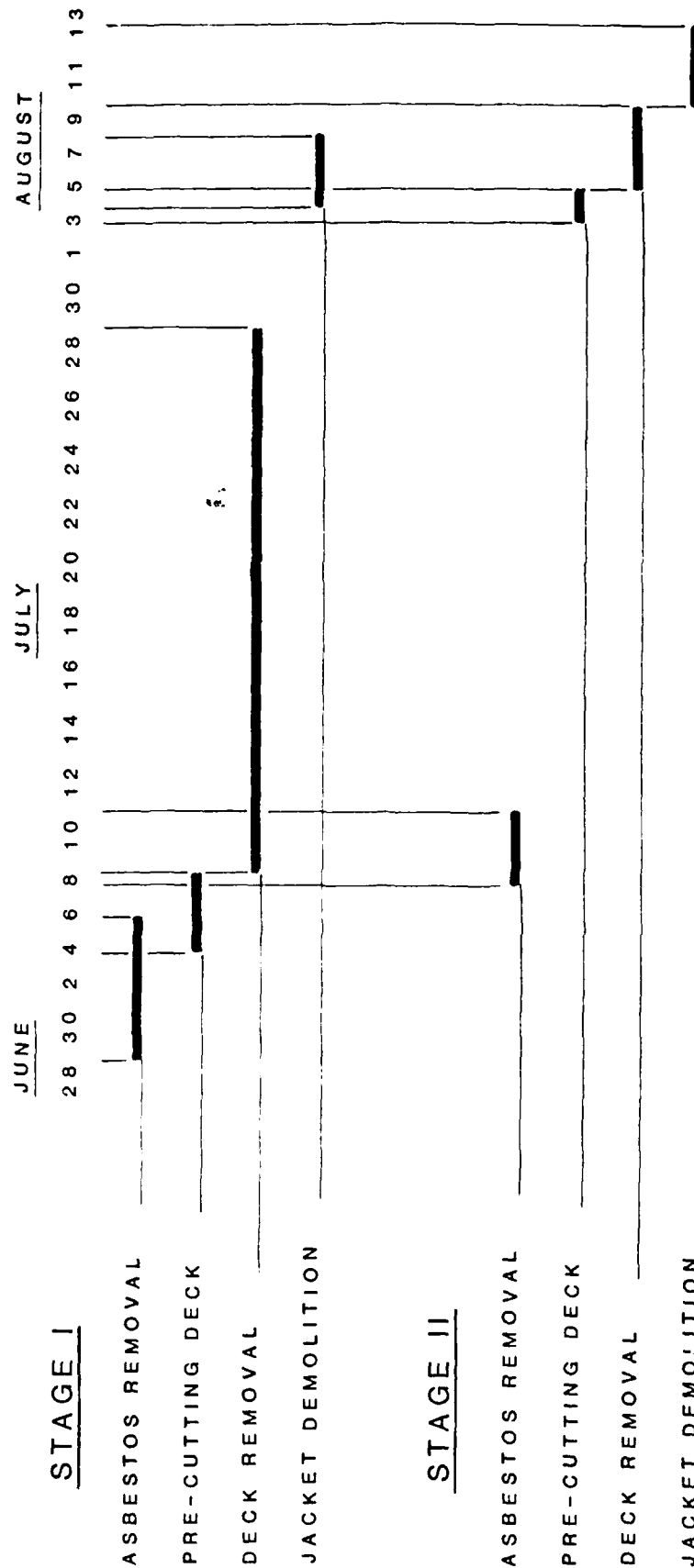


FIGURE 45



Figure 46. A Barracuda Picked Up After a Shot at Stage I



Figure 47. Disposal of Asbestos Waste

LIST OF TABLES

| <u>Table Number</u> | <u>Title</u> |
|---------------------|--|
| 1 | General Characteristics of the Platforms |
| 2 | Organization of the Project |
| 3 | Problems and Approach |
| 4 | Project Use of the Stages 1974 - 1980 |
| 5 | Status of Sensors on Stage (Oct. 1982) |
| 6 | Organization |
| 7 | Summary of Contractor's Effort |
| 8 | Reef Characteristics |
| 9 | Estimate of Fish Killed |
| 10 | Costs for Demolition of Stages I and II |

TABLE I

PLATFORM CHARACTERISTICS

27 YEAR OLD PLATFORMS

| | STAGE I (12 N.M. OFFSHORE) | STAGE II (1.75 N.M. OFFSHORE) |
|---------|--|---|
| DECKS | 105' X 105' X 25' 784 TONS | 60' X 84' X 36' 443 TONS |
| JACKETS | 16 - 30" PILES (2 JACKETS) 105' WATER DEPTH | 9 PILES (8 - 24", 1 - 28") 60' WATER DEPTH |

TABLE 2

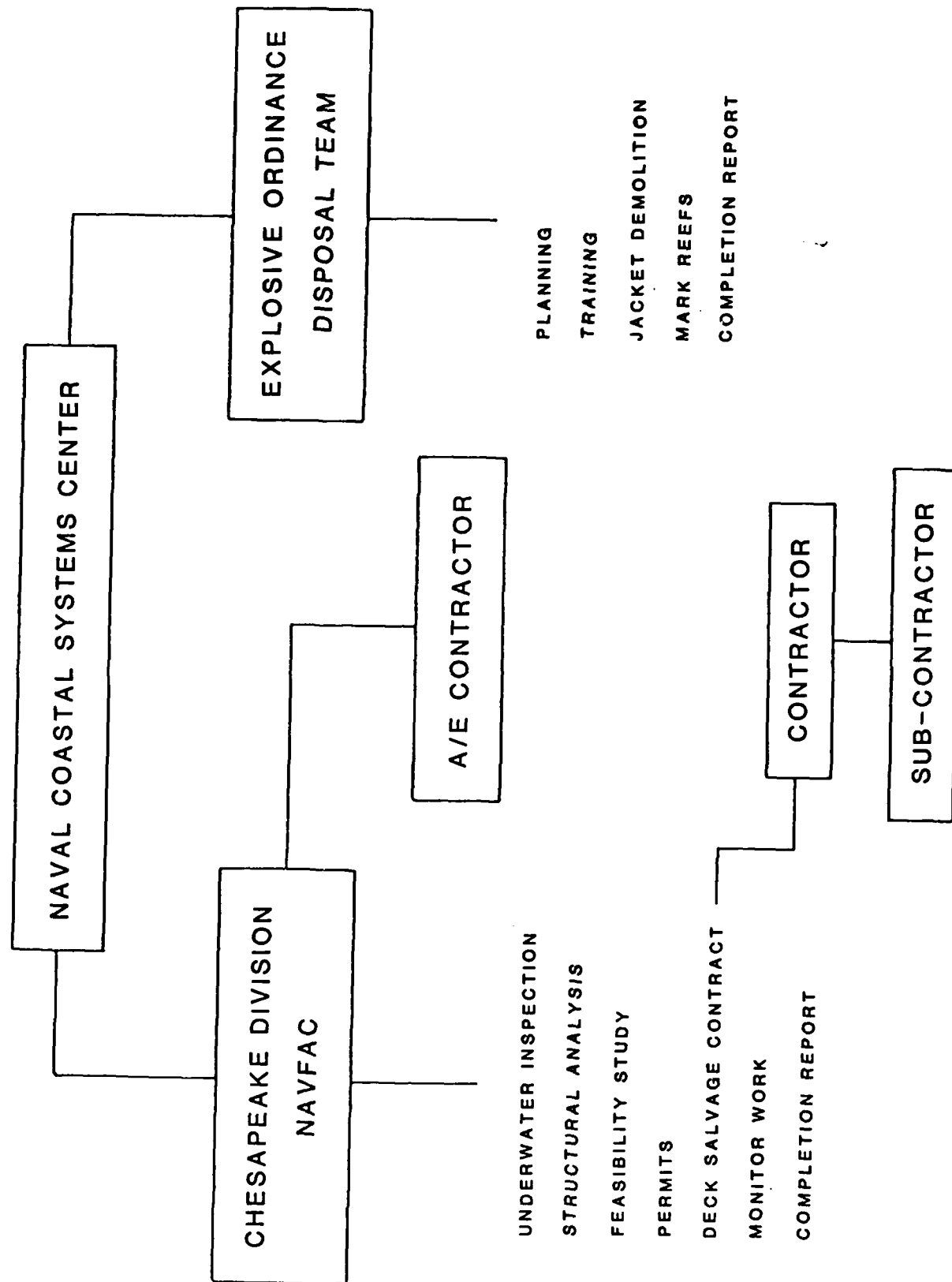


TABLE 3

STAGES I AND II

PROBLEMS:

STRUCTURE UNSOUND RESULTING IN RESTRICTED USAGE
OBSOLETE OFFSHORE PLATFORMS
POLLUTION HAZARD
NAVIGATION HAZARD
EXPENSIVE MAINTENANCE

APPROACH:

- (1) REMOVE ASBESTOS AND OIL
- (2) CUT UP AND REMOVE DECKS FOR SALVAGE
- (3) DEMOLISH JACKET AND PILES IN PLACE TO FORM
ARTIFICIAL FISHING REEFS

TABLE 4. PROJECT USE OF STAGES

1974 - 1980

1. RADAR EVALUATION OVER WATER

| | | |
|--------------------|--------------|------------------|
| Sea Echo | NADC/Ga Tech | Sea return |
| Sea Clutter | NRL/Ga Tech | Sea return |
| Radar Buoy | NSWC/Ga Tech | Buoy Signature |
| ADF Equip Eval | PME-107 | Surface scatter |
| Small Target Radar | NRL | Floating targets |
| Wave Ht Sensor | SESTF | Over water test |
| O.T.H. Radar | NRL | Over water test |

2. SONAR EVALUATION IN WATER

| | | |
|------------------|-------------------|----------|
| PARRAY | DARPA/NAVELEX/ARL | Open sea |
| Parametric Sonar | DARPA/NAVELEX/ARL | Open sea |
| Bistatic Sonar | NCSC | Open sea |

3. ATMOSPHERIC MEASUREMENTS/EFFECTS

| | | |
|----------------------|--------------------|--------------------|
| Sunglitter | APL/JHU | Open air/sea |
| Sky-Water Light | NRL | Open air/sea |
| Fog Study | NAFI/CSI | Open water |
| Remote Sensors | NAFI/CSI/EPA, etc. | Ground truth |
| Ships Lighted Tests | NCSC | Remote open water |
| Night Vision Goggles | NCSC | Open water targets |

4. STABLE PLATFORM IN OPEN WATER

| | | |
|-----------------|----------------|----------------------|
| OMEGA | NRL | Propagation study |
| BRA-8 | APL/JHU | Buoy performance |
| WIRAD | APL/JHU | Antenna test |
| TEAK OIL | PME-107 | Antenna/Revr test |
| Oil Barrier | USCG | Observation platform |
| Wave Dynamics | APL/JHU | Instrument platform |
| Plankton Effect | Univ of Texas | Clear, open water |
| Infrared Tests | TRW | Measurements |
| Oil Pollution | EPA | Clean sea water |
| XP Plastic | Army/NRL | Salt air effects |
| LIDO | NCSC | Instrument platform |
| MAST | NCSC | Instrument platform |
| Internal Wave | NCSC | Instrument platform |
| Sonobuoy Drops | NAVAIR | Observation platform |
| Ordinance Drops | Navy Ammo Dump | Photo platform |

TABLE 4. (CONTINUED)

5. GENERAL ENVIRONMENTAL DATA SUPPORT

| | |
|------------------|-----------|
| SES-100B Trials | SESTF |
| JEFF Craft Tests | AALC-ETU |
| LACV-30 | Army |
| Coast Guard Sled | USCG |
| Sea/Air Rescue | USCG |
| Data Buoy | NORDA |
| Voyageur Ops | Army/Bell |
| HADAPS | USMC |
| Wave Rider Eval | AALC-ETU |

6. MISCELLANEOUS

| | | |
|--------------------|--------------|-------------------|
| RAYDIST Site | NCSC | Ship positioning |
| SEAL Team Use | Navy | Training |
| Current Meter Eval | NORDA | Open sea |
| Marine Fouling | US/UK Navies | Open sea |
| Helo Acoustic Sig. | NCSC | Over water |
| Wave Profile | APL/JHU | Statistical study |
| Magnetic Barrier | NCSC | Open water |
| Laser Eval | Various | Open space |

7. TEST SUPPORT TOO NUMEROUS TO IDENTIFY SEPARATELY

Diving Equipment Evaluation
 Acoustic Measurements
 Magnetic Measurements
 Diver Training
 Diver Requalification (100' depth)
 Scientists-in-the-Sea (FSU)
 Numerous Telephone Calls (NCSC, TAFB, Eglin, etc.)

TABLE 5. STATUS OF SENSORS ON STAGES
(OCTOBER 1982)

| SENSORS | STAGE I | STATUS |
|---|----------|------------------------------|
| Wavegages (10') | 4 ea. | 1 operative 3 inoperative |
| Current Meter | 1 ea. | Unknown |
| Air Temperature | 1 ea. | Operative |
| Baro. Pressure | 1 ea. | Operative |
| Relative Humidity | 1 ea. | Inoperative |
| Wind Speed | 1 ea. | Operative |
| Wind Direction | 1 ea. | Operative |
| Water Temperature | 1 ea. | Inoperative |
| Baylor Wave Gages (100') (NORDA Support) | 3 ea. | Operative |
| SENSORS | STAGE II | STATUS |
| Wavegages (10') | 4 ea. | Inoperative |
| Current Meter | 1 ea. | Inoperative |
| Air Temperature | 1 ea. | Inoperative |
| Baro. Pressure | 1 ea. | Operative |
| Relative Humidity | 1 ea. | Inoperative |
| Wind Speed | 1 ea. | Operative |
| Wind Direction | 1 ea. | Operative |
| Water Temperature | 1 ea. | Inoperative |
| Wavegage (30') | 1 ea. | Inoperative |

(Telemetry Transmitter on Stage II is inoperative)

TABLE 6

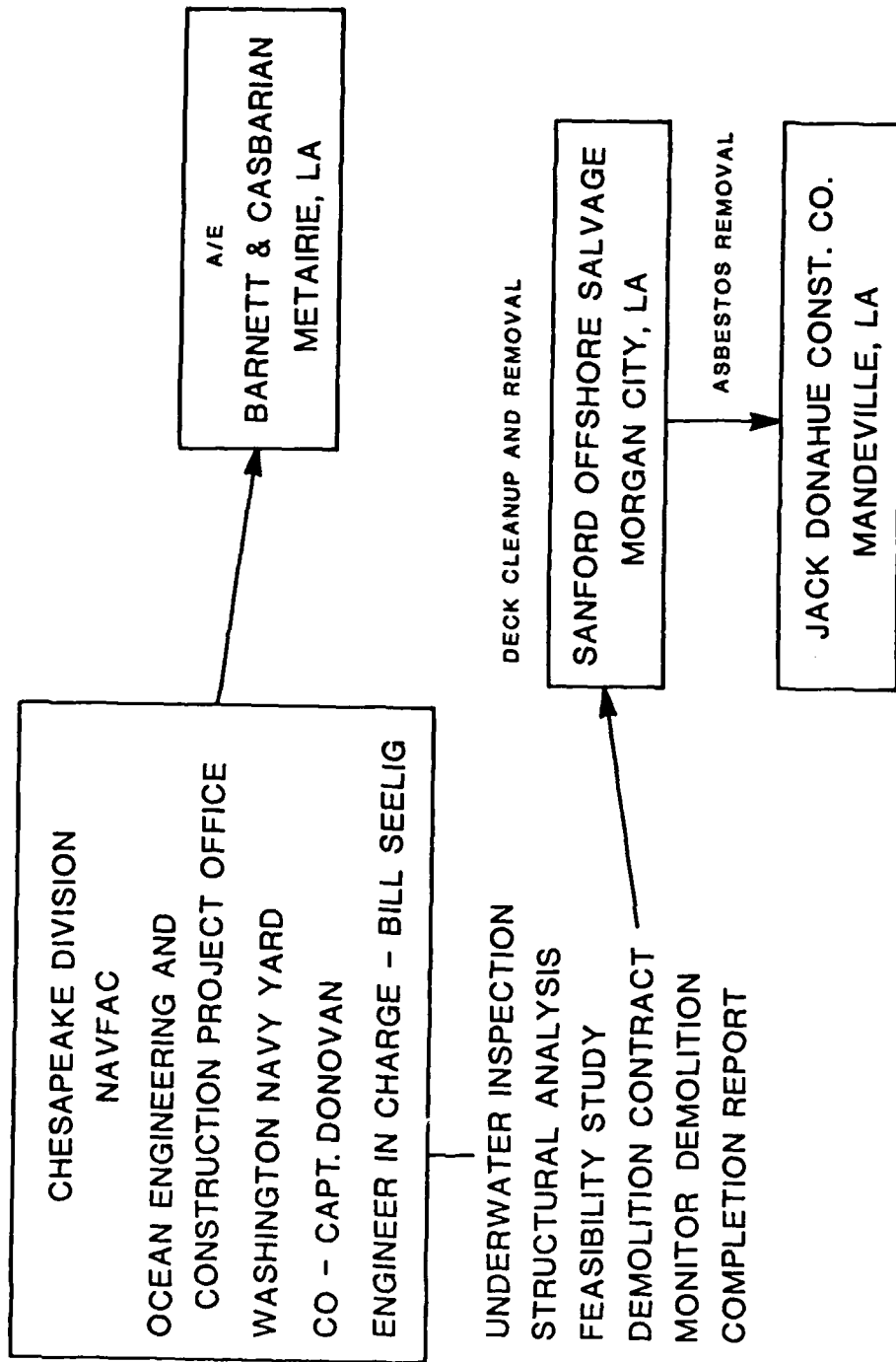


TABLE 7. SUMMARY OF CONTRACTOR'S EFFORT
CLEANUP AND SALVAGE OF STAGES I AND II

| <u>Location</u> | <u>Days of Work*</u> | <u>Number of Sections Lifted</u> | <u>Range of Weights of Sections Lifted</u> | <u>Total Weight</u> |
|-----------------|----------------------|--------------------------------------|--|---------------------|
| STAGE I | 16.5 | 7 | 75-200 Tons | 755 Tons |
| STAGE II | 10.5 | 5 | 60-110 Tons | 420 Tons |

*Note: There were 20 additional days of down time.
15-1/2 days were due to weather.
4-1/2 days were due to equipment problems.

TABLE 8. REEF CHARACTERISTICS

| <u>Location</u> | <u>Water Depth (FC)</u> | <u>Specified Depth of Reef (FC)</u> | <u>Actual Depth of Reef (FC)</u> | <u>Loran Coordinates</u> |
|-----------------|-----------------------------|---|--|------------------------------|
| Stage I | 105 | 55 | 68* | 46958.1 13980.3 |
| Stage II | 60 | 40 | 40* (or More) | 46997.9 14069.1 |

* These depths were reported by the EOD and obtained from depth readings taken with calibrated (start of mission) divers wrist depth gauges.

TABLE 9. ESTIMATE OF FISH KILLED*

| <u>Location</u> | <u>Number of Main Shots</u> | <u>Number of Small** (Under 1' Long)</u> | <u>Number of ~ Large*** (Over 1' Long)</u> |
|-----------------|---------------------------------|--|--|
| Stage I | 4 | 215 | 34 |
| Stage II | 3 | Several Thousand | 3 |

* Based on visual observations of dead fish on the surface after the shots. An undetermined number of fish may not have surfaced.

** Small fish were eaten by Seagulls and Pelicans. The birds were quick to flock to the site as soon as they realized food was available.

*** Larger fish were taken and eaten by the work crews.

TABLE 10.
COSTS FOR DEMOLITION OF STAGES I AND II
NCSC, PANAMA CITY, FLORIDA

| ITEM | ENGINEERING AND MONITORING | | | COSTS |
|--|-----------------------------|-------------------|-----------|--------------|
| | CHESDIV | A/E | TOTAL | |
| Phase A - Feasibility/concepts | \$17,000. | \$ 52,044. | \$69,044. | |
| Phase B - Plans & Specs | \$11,300. | \$ 51,673. | \$62,973. | |
| Phase C - Post Award Services | <u>\$27,100.</u> | <u>\$ 35,227.</u> | \$62,327. | |
| | \$55,400. | \$138,944. | | |
| | Engineering Services Total | | | \$ 194,344. |
| Remove Decks and Cleanup by Contractor | | 1,293,800. | | |
| EOD Demolition Work | | | | |
| (Direct Funding to EOD) | estimated \$ <u>98,000.</u> | | | |
| | Demolition Work Total | | | \$1,391,800. |

LIST OF APPENDICES

APPENDIX

- A CHRONOLOGICAL HISTORY OF THE STAGES
- B CONTRACTOR PERSONNEL AND EQUIPMENT
- C DAILY SUMMARY LOG OF CONTRACTOR'S ACTIVITIES
- D DAILY SUMMARY LOG OF EOD ACTIVITIES
- E ASBESTOS DATA
- F REFERENCES

APPENDIX A. CHRONOLOGICAL HISTORY OF THE STAGES

| <u>Date</u> | <u>Event</u> |
|---------------------|---|
| Early 1950's | Stage I and II Platforms Designed |
| 19 June 1956 | Bids Opened to Build Platforms |
| Mid 1957 | Both Platforms Installed |
| 25 Oct. 1961 | Attending Crews Removed |
| 1964 | SEALAB Experiments |
| 19 June 1968 | Code 420, NCSC, Requests Inspection |
| 23-31 July 1968 | U/W Inspection Performed by Military Divers, Code 455 |
| July 1968 | Condition Report, Stages I and II |
| Sept. 1968 | Recommendations, Stages I and II |
| July 1969 | U/W Inspection |
| August 1969 | Condition Report, Stage II (Includes Comparison of '68 and '69 Insp. & Recommendations) |
| Oct. 1969 | Request for Inspection, Stages I and II (Includes Procedures) |
| 15 Oct. 1969 | Continuation of Underwater Inspection, Stages I and II (Continuation of Aug. 69 Insp.) |
| Nov. 1969 | Report of Inspection, Stage II Report of Inspection, Stage I |
| June 1970 | Anodes for Cathodic Protection System Renewed on Stage I |
| Aug. 1970 1970's | Anodes Renewed on Stage II, Increased Number by 25% Periodic Visual "Swim-by" Inspections of the Jacket by Military Divers |
| 30 Oct. 1978 | Preliminary Report on U/W Inspection of Stage I and II |
| 28 July 1980 | Contract for Engineering, Analysis, and Field Inspection of Two Offshore Platforms Awarded to Barnett & Casbarian, Inc. (BCI) #N62477-80-C-0194 (\$144,275 Total) |

| <u>Date</u> | <u>Event</u> |
|---------------|---|
| 7 Oct. 1980 | Site Visit to Platforms and Meeting between Barnett & Casbarian, Inc. and Assistant OICC. Structural Analysis Requested at this Meeting |
| 24 Nov. 1980 | Phase A - Inspection Plan Review Meeting, Stages I and II, NCSC |
| 3-9 Dec. 1980 | Stage I and II Underwater Inspection (Visual Inspection, Cleaning, Meter Readings, Still Photos, Video Documentation) |
| 12 Jan. 1981 | Phase B - Project Meeting - Inspection Results Discussed |
| 27 Feb. 1981 | Phase C - Project Completion Review Meeting at NCSC Safety Precautions Recommended |
| 2 Mar 1981 | Submittal of Platform Strength Evaluation, Stage I and II |
| 23 Sept. 1982 | CHESNAVFACENGCOM (FPO-1) Funded to Perform Feasibility Study of Stage Removal |
| 1 April 1983 | A/E Contract Awarded to Barnett & Casbarian, Inc. |
| 18 April 1983 | Pre-Design Meeting at NCSC |
| 19 April 1983 | Stage I and II Above Water Platforms Inspected by FPO-1 and NCSC - Equipment on Platforms Recorded |
| May 1983 | Issued Preliminary Report No. 1 - Contained Inspection Results |
| June 1983 | Issued Preliminary Report No. 2 - Contained Alternatives, Working Cost Estimates, and Pertinent Laws and Regulations |
| 7 July 1983 | Progress Report Meeting at NCSC to Discuss Alternatives and Cost Estimates |
| July 1983 | Larry Taylor, FL Dept of Environmental Protection Inspected Topside of Stages I and II to Check on Possibility of Making Reef Out of Topside |
| Aug. 1983 | Final Report by Barnett & Casbarian, Inc. issued - Contained Equipment Inventory, Inspection Results, Principal Alternative for Disposal and Evaluation of the Most Feasible Alternatives. |
| 12 Oct. 1983 | PEA on EOD Explosive Tests |
| 21 Nov. 1983 | Coast Guard Waiver for Lighted Buoys Issued |

| <u>Date</u> | <u>Event</u> |
|---------------|--|
| 2 Jan. 1984 | Florida, Dept. of Natural Resources Approval |
| 9 Feb. 1984 | Commerce Business Daily Announcement of Bids |
| 22 Feb. 1984 | Florida, Dept. of Envir. Reg. Permit Issued |
| 20 March 1984 | Army Corps of Engineers Permit Issued |
| 2 April 1984 | Bid Package Mailed Out (30 Requests) |
| 17 April 1984 | Bidders Site Visit |
| 18 April 1984 | PEA Completed |
| 2 May 1984 | Bids Opened (6 Bids) |
| 1 June 1984 | Deck Removal Contract Awarded to Sanford Offshore Salvage, Inc. |
| 7 June 1984 | Pre-Demolition Meeting (NCSC, Contractors, CHESDIV & EOD) |

(SEE APPENDICIES C AND D FOR A DETAILED
SUMMARY OF THE SALVAGE AND DEMOLTION WORK)

APPENDIX B. CONTRACTOR PERSONNEL AND EQUIPMENT

| | Number of Personnel | Phone | Address |
|--------------------------------|------------------------|----------------|--------------------------|
| <u>Main Contractor</u> | | | |
| Owner (1) | (1) | (504)-631-0836 | Sanford Offshore Salvage |
| Logistics Manager | (1) | | P. O. Box 2523 |
| Captain | (1) | | Morgan City, La. 70381 |
| Foreman | (1) | | |
| Welder/Rigger | (5) | | |
| Cook | (1) | | |
| <u>Asbestos Sub-Contractor</u> | | | |
| Supervisor | (1) | (504)-626-4431 | Jack Donahue Con. Inc. |
| Ind. Hygenist | (1) | | P. O. Box 159 |
| Air Monitor Tech. | (1) | | Mandeville, La. 70448 |
| Crew | (7) | | (Attn: Bob Kieferle) |
| <u>Crew Boat "Dot"</u> | | | |
| Boat Operator | (1) | | |
| <u>Tug Boat "Cindy F"</u> | | | |
| Captain | (1) | | |
| Crew | (2) | | |

APPENDIX B

100'

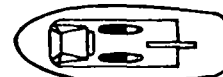
CREW BOAT FOR TRANSFERING PERSONNEL

" DOT "



TUG BOAT FOR PROVIDING SUPPORT

" CINDY F "



MATERIALS BARGE WITH " CHERRY PICKER " FOR PROVIDING MISCELLANEOUS SUPPORT

" RG 40 "

110' X 40' X 8'

2 SEA MULES FOR PROPULSION

MAIN BARGE FOR LIFTING DECK SECTIONS AND PROVIDING LIVING QUARTERS

4 - 3000 LBS. LWT ANCHORS

" SEA SALVOR "

150' X 50' X 10'

A - FRAME

200 TONS LIFT CAPACITY

ELEVATION= 100 FEET OFF OF DECK

MATERIALS BARGE TO TRANSPORT PLATFORM DECK SECTIONS

" DB-4 "

300' X 85' X 14'

SPUDS FOR HOLDING BARGE IN PLACE

CONTRACTORS EQUIPMENT

APPENDIX C. DAILY SUMMARY LOG OF CONTRACTOR'S ACTIVITIES

| <u>DATE</u> | <u>SUMMARY OF ACTIVITY</u> | <u>DAYS DOWNTIME</u> W = weather <u>Due to Weather</u> |
|-------------|---|--|
| 2 Apr 84 | Bid Packages Mailed Out | |
| 17 Apr 84 | Site Visit | |
| 18 Apr 84 | PEA Completed | |
| 2 May 84 | Bids Opened | |
| 1 Jun 84 | Contract Award | |
| 7 Jun 84 | Pre-demolition Conference at NCSC | |
| 27 Jun 84 | Contractor Arrives at Panama City | |
| 28 | Poor Weather | 1 W |
| STAGE I | | |
| 29 Jun 84 | First day of Asbestos Removal (Non-friable) | |
| 1 Jul 84 | Poor Weather | 1 W |
| 2 Jul 84 | Poor Weather | 1 W |
| 3 Jul 84 | Unload Asbestos Gear on Stage I, Continued Work | |
| 4 Jul 84 | Pre-cut Main Deck, Continued Asbestos Removal | |
| 5 Jul 84 | Cutting & Asbestos Work, Met EOD Team at Stage I | |
| 6 Jul 84 | Asbestos Stage I complete, Pre-Cutting 95% Complete | |
| 7 Jul 84 | Unloaded Stage I Equip. Containers | |
| 8 Jul 84 | Loaded Equip. Containers Stage II. Asbestos Removal Stage II | |
| 9 Jul 84 | 1st Lift Stage I, Asbestos Work Stage II | |
| 10 Jul 84 | Asbestos Work Stage II | 1 E |
| 11 Jul 84 | Unloaded Section 1 on Deck, Welded doubler plates on boom, finished asbestos Stage II | 1 E |
| 12 Jul 84 | Finished Welding Doubler Plates, "DB4" arrives | 1 E |

APPENDIX C. (CONTINUED)

| <u>DATE</u> | <u>SUMMARY OF ACTIVITY</u> | <u>DAYS DOWNTIME</u> W = weather E = equipment |
|-------------|--|--|
| 13 Jul 84 | Put Section 1, Stage I on DB-4, Spudded down DB4, unloaded container off Stage II | |
| 14 Jul 84 | Removed Section 2, Stage I | |
| 15 Jul 84 | Removed Section 3, Stage I | |
| 16 Jul 84 | Removed Equipment from stage I deck (Solar panel, antennae tower, crash crane, fog horn) | |
| 17 Jul 84 | Poor Weather | 1 W |
| 18 Jul 84 | Poor Weather | 1 W |
| 19 Jul 84 | Poor Weather | 1 W |
| 20 Jul 84 | Poor Weather | 1 W |
| 21 Jul 84 | Poor Weather | 1 W |
| 22 Jul 84 | Removed Sections 4 and 5, Stage I | |
| 23 Jul 84 | Unloaded Sections 4 and 5, Stage I, on DB-4 | 1/2 W |
| 24 Jul 84 | Poor Weather | 1 W |
| 25 Jul 84 | Rigged up Section 6, Stage I (Damaged Lift Cable) | 1/2 E |
| 26 Jul 84 | Removed Section 6 and Purged Fuel Tank | |
| 27 Jul 84 | Rigged Section 7, Storm Prevented Lifting, Had to Unhook | 1/2 W |
| 28 Jul 84 | Lifted Section 7, Stage I | |
| 29 Jul 84 | Contractor Unloaded Sections #6 and #7 on DB-4 | |

APPENDIX C. (CONTINUED)

| <u>DATE</u> | <u>SUMMARY OF ACTIVITY</u> | <u>DAYS DOWNTIME Due to Weather</u> |
|-------------|---|---|
| | STAGE II | |
| 8-11 Jul 84 | Asbestos Removal | |
| 30 Jul 84 | Contractor got more Welding Supplies; High Waves | 1 Day |
| 31 Jul 84 | Weather, Work being done on Tug | 1 Day |
| 1 Aug 84 | Weather poor, Unable to Work Stage II | 1 Day |
| 2 Aug 84 | Weather poor, Unable to Work Stage II | 1 Day |
| 3 Aug 84 | Pumped Fuel Stage II thru the Night 20,000 gals | 1/2 Day |
| 4 Aug 84 | Put Nitrogen in Fuel Tank, Began Precutting | |
| 5 Aug 84 | Lifted Section 1, Stage II and Equipment | |
| 6 Aug 84 | Precutting | |
| 7 Aug 84 | Lifted Section 2 and 3 | |
| 8 Aug 84 | Lifted Sections 4 and 5 | |
| 9 Aug 84 | Returned Equipment to Navy and Departed Panama City | |

APPENDIX D. DAILY SUMMARY LOG OF EOD ACTIVITIES

| <u>DATE</u> | <u>SUMMARY OF ACTIVITY</u> | <u>DAYS DOWNTIME Due to Weather</u> |
|--------------|--|---|
| 9-22 Jul 84 | Training | |
| 23-28 Jul 84 | Delay due to Contractor | |
| 29 Jul 84 | Inspected Stage I | 1 Day |
| 30 Jul 84 | Poor Weather | 1 Day |
| 31 Jul | Poor Weather | 1 Day |
| 1 Aug 84 | Poor Weather | 1 Day |
| 2 Aug 84 | Poor Weather | 1 Day |
| 3 Aug 84 | High Waves | 1 Day |
| 4 Aug 84 | Shot Northern Jacket on Stage I (It did not topple) | |
| 5 Aug 84 | Inspected Effect of First Shot to Reformulate Plan | |
| 6 Aug 84 | Second Shot on Stage I Northern Jacket (It did not Topple due to Firing Problems) | |
| 7 Aug 84 | Third and successful Shot on Stage I Northern Jacket | |
| 8 Aug 84 | Toppled Southern Jacket on Stage I | |
| 9 Aug 84 | Day Off | |
| 10 Aug 84 | Cut Cross Members on Stage II | |
| 11 Aug 84 | Toppled 3 Western Legs on Stage II Jacket | |
| 12 Aug 84 | Poor Weather | 1 Day |
| 13 Aug 84 | Toppled Remaining 6 Legs on Stage II | |
| 14 Aug 84 | Swim-by of Stage II Reef | |

APPENDIX E. ASBESTOS DATA

Contractor Performing Removal and Disposal:

Jack Donahue Contractors, Inc.
P. O. Box 159
Mandeville, LA 70448
(504) 626-4431

On-Site Manager: Bob Kieferle

Wetting Agent:

Aqua-Grow Asbestos Wet by Asbestos Control Technology, Inc.

Asbestos Sealer:

Foster #32-21 Blue Encapsulant

Air Monitoring:

Each crew is made up of two (2) men -- one (1) of two-man crew will wear a personal monitor.

Testing Laboratory:

Technician -- Employee of Durio Consulting Services
122 St. John Street
Luling, LA 70070
(504) 785-1484

Lab -- West Payne
7979 GRSI St.
Baton Rouge, LA
(504) 769-4900

Industrial Hygienist:

Durio Consulting Services
122 St. John Street
Luling, LA 70070
(504) 785-1484 #1549

Durio Consulting Services
Luling, LA 70070
July 27, 1984

Twenty-two (22) filter cassette samples were received from Durio Consulting Services for asbestos fiber count analysis on 07-02-84, 07-06-84, and 07-09-84. Fibers larger than 5 microns in length were counted by means of phase-contrast microscope at a magnification of 400X. The procedure recommended by NIOSH (P & CAM 239) was followed.

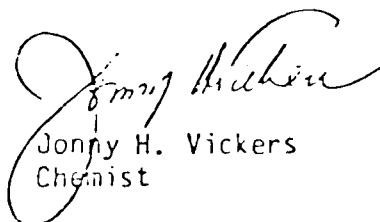
| <u>Sample Identification</u> | <u>Fibers (>5µm) Observed</u> | <u>No. of Fields Observed</u> | <u>Fibers per Filter</u> | <u>Volume of Air (L)</u> | <u>Fibers (>5µm) per c.c. of Air</u> |
|------------------------------|----------------------------------|-------------------------------|--------------------------|--------------------------|---|
| 06-29-84 | | | | | |
| 644-1 | 30 | 100 | 42,750 | 360 | 0.12 |
| 644-2 | 32 | 100 | 45,600 | 360 | 0.13 |
| 644-3 | 0 | 100 | <1,425 | 360 | <0.01 |
| 07-03-84 | | | | | |
| 644-4 | 1 | 100 | 1,425 | 360 | <0.01 |
| 644-5 * | 0 | 100 | <1,425 | 1,140 | <0.01 |
| 644-6 * | 3 | 100 | <1,275 | 1,140 | <0.01 |
| 644-7 * | 0 | 100 | <1,425 | 1,140 | <0.01 |
| 644-8 ** | 0 | 100 | <1,425 | 960 | <0.01 |
| 644-9 ** | 0 | 100 | <1,425 | 960 | <0.01 |
| 644-10 ** | 0 | 100 | <1,425 | 960 | <0.01 |
| 07-06-84 | | | | | |
| 644-11 | 6 | 100 | 8,550 | 940 | <0.01 |
| 644-12 | 15 | 100 | 21,375 | 940 | 0.02 |
| 644-13 | 4 | 100 | 5,700 | 940 | <0.01 |
| 07-09-84 | | | | | |
| 644-14 | 9 | 100 | 27,075 | 780 | 0.03 |
| 644-15 | 11 | 100 | 15,675 | 780 | 0.02 |
| 644-16 | 1 | 100 | 1,425 | 780 | <0.01 |

Durio Consulting Services
Luling, LA 70070
July 27, 1984

| <u>Sample Identification</u> | <u>Fibers ($>5\mu\text{m}$) Observed</u> | <u>No. of Fields Observed</u> | <u>Fibers per Filter</u> | <u>Volume of Air (L)</u> | <u>Fibers ($>5\mu\text{m}$) per c.c. of Air</u> |
|----------------------------------|--|---------------------------------------|----------------------------------|----------------------------------|---|
| 07-10-84 | | | | | |
| 644-17 | 91 | 100 | 129,675 | 660 | 0.20 |
| 644-18 | 16 | 100 | 22,800 | 660 | 0.03 |
| 644-19 | 1 | 100 | 1,425 | 660 | <0.01 |
| 07-11-84 | | | | | |
| 644-20 | 127 | 100 | 180,975 | 480 | 0.38 |
| 644-21 | 78 | 100 | 111,150 | 480 | 0.23 |
| 644-22 | 6 | 100 | 8,550 | 480 | 0.02 |

* 07-04-84

** 07-05-84


Jonny H. Vickers
Chemist

ASBESTOS WASTE DISPOSAL INFORMATION

Total Weight: 9000 pounds

Type: Friable, non-friable and glass insulation suspected of being contaminated

Disposal Site: American Waste
P. O. Box 26232
New Orleans, LA 70186

"Kelvin Site", at Boutee, LA

Disposal Method:

Material was brought to the site in approved sealed 6 mill plastic bags. The bags were thoroughly wetted. For extra safety, the bags were dumped and buried while it was raining on 30 August 1984.

APPENDIX F. REFERENCES

1. "Stage I and II Platform Strength Evaluation Offshore Panama City, Florida", Barnett & Casbarian, Inc., February, 1981.
2. "Demolition/Salvage Analysis of Offshore Platforms (Stage I and II) at the Naval Coastal Systems Center, Panama City, Florida", BCI, August, 1983.

END